The Andover Review

A JOURNAL FOR SECONDARY EDUCATION

Fall 1978

Learning in Adolescence II

THIS ISSUE, as has been the case with many before it, bears the unmistakable imprint of Christopher D. Kirkland. He has been a member of the board from the first issue. He now leaves for other activities in other places. The magazine will miss his imagination and inventiveness, his vigorous editing, his contributions and those he gained from others.

Herewith is the second issue devoted to the symposium on Learning in Adolescence, the aftermath. Among the most provocative of the discussions within the symposium were those of the scientists and their concern with the cognitive development of the adolescent. It is therefore appropriate that we should lead off with Arnold Arons' succinct statement on modes of reasoning, followed by Christopher Kirkland's demonstration of how these find their way into his classroom. Robert Kegan's article is a reflection of another line of inquiry – the interrelationship of the young and the adult, a call for affection and love. Denis Phillips reminds us of the pitfalls of psychological research and findings. Elise Pachter, though not a participant, gives us an insight into how the late adolescent pictures herself or himself, a view notably lacking in the symposium and therefore welcome. Joan Lipsitz explores the phenomenon of hunger, which we touched but is here developed in a forceful way. Peter Farrow demonstrates that he is more than the maker of telling drawings. His anatomy is not easy to follow but will more than repay the careful reader. Thus, by chance or by design all three of the sub groups of the symposium are represented. It is impossible to encompass a wide-ranging discussion of three days in one issue. However, Kirkland taped and has transcribed all the discussion; these transcriptions should be available soon for those who are interested.

None of this would have been possible without the support and encouragement of the Ford Foundation and the William T. Grant Foundation. We are most grateful to both.

Grateful as we are, we now turn in our next issue to more general matters and continue our inquiry into secondary education. As always we welcome reaction to articles already published or any inquiry which bears upon the central concern of this magazine.

The Editor

THE REVIEW invites articles, poetry and graphics from all quarters and will select material with concern for secondary education. If mailed, graphic work should be insured by the sender. It will be returned in due course in the same manner.

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The Editor
The Andover Review

As for the Symposium, let it be said that we groped the beast, shinnied its leg, wrestled its trunk, spliced its tail, balming with *bonhommie* the chafes of diametrical cognitions: Sizer insisting on many elephants, Brown on metaphoric ones, Bauman and Arons on neat unwrinkled ones, and so on. Remarkably, the Symposium produced but two casualties: The Jacklin Hypotheses, which, being restricted to female elephants only, were deftly tabled, and the Proofs of Opposable Thumbs (advanced by some odd old ducky from Maine) which were withdrawn on discovering that he had been groping not an elephant but a physicist.

As for myself, I thought it best to let my colleagues have their little day since, sooner or later, they all must come round to the only possible *correct* conclusion – mine.

For the elephant, especially between 14 and 18, is wall, all wall and nothing but wall – against which we are every damned one of us up.

Peter Farrow

Reasoning Modes and Processes Arising in Secondary and College Level Study of Natural Science, Humanities, and the Social Sciences

ARNOLD B. ARONS

This paper is an outgrowth of discussions taking place at the Andover Symposium on Learning in Adolescence within the sub-group that concerned itself with the problem of advancement of cognitive development. The basic list of reasoning modes and processes was generated in the course of the discussions. Additional details of illustration and interpretation are the personal contributions and opinions of the author.

One component of the broad problem of Learning in Adolescence is the question of intellectual growth and development, and an intrinsic aspect of the latter is the development of the capacity for abstract reasoning. In an effort to achieve a higher degree of specificity in its discussions, the symposium team that concerned itself with the problem of advancement of cognitive development attempted a listing of some modes of reasoning and levels of awareness of one's own thought processes that are either tacitly taken for granted or need to be consciously developed in secondary school and introductory college instruction. Without pretence to completeness and without implication of strict hierarchical ordering, a tentative list emerged as follows:

Recognition, identification, and control of variables.

e.g., recognition of the possible influence of length, thickness, and material, and control of two of these variables in establishing the effect of the third in the well-known Piagetian task of bending rods; recognition of economic, military, political, or social factors in an historical problem, and, in the information available, discerning whether conclusion as to cause and effect relationship is possible or whether the variables are so confounded as to preclude a reliable conclusion.

Elementary propositional logic

Syllogistic (if . . . then . . .) reasoning involving one or two steps. Forming and understanding statements involving inclusion, exclusion, and serial ordering. Correctly interpreting syntactical subtleties such as double negatives, subjunctive mood, etc.

Reading a paragraph of text and re-stating its content and meaning by translation into one's own words.

Awareness of gaps in knowledge or information:

Recognizing when one does not understand the meaning of a word appearing in an oral presentation or passage of text and sensing the need of establishing its meaning.

Recognizing incompleteness of information in a particular context and realizing that a definite conclusion cannot be reached, or realizing that conclusions or decisions are being made as best they can in the face of incomplete data and qualifying the results accordingly; i.e., developing recognition and tolerance of ambiguity.

In a given sequence of development, recognizing what has become known and established at a particular point while also recognizing what questions still remain unanswered or even anticipating some still to be asked.

Giving clear operational definitions of terms or concepts, recognizing the necessity of using only words that have prior definition, and being aware of the appeal to shared experience in the shaping of definitions.

Doing arithmetical reasoning involving ratio, proportions, and the consequences of the process of division.

Translating words into symbols and symbols into words.

e.g., translating a verbal problem into the symbols of algebra or arithmetic or into a graphical representation; translating a graph or other graphical or diagramatic representation into words, and extracting all of the content and implications.

Discriminating between observation and inference.

e.g. In a scientific context, recognizing in a text presentation or in laboratory work the observational, empirical, or experimental facts that are available and separating these from the concepts that are formed or inferences that are drawn from the facts. Recognizing the difference between analysis of the structure of a poem and an interpretation of the poem. Recognizing the difference between historical data and the historian's interpretation of the data.

Drawing inferences from data or evidence.

e.g. From observation of lunar phases and the position of the moon relative to the sun, drawing the inference that moonlight is reflected sunlight. Given the code of Hammurabi inferring from this code of laws something of how the people who generated it lived and what they held to be of value.

Following the inductive reasoning pursued in the generation of a model or a theory; using deductive reasoning to test the validity of a model or theory and to extract predicted consequences or explanations.

Doing hypothetico-deductive reasoning.

e.g. Visualizing, in the abstract, the outcomes that might stem from changes imposed on some given system or situation, whether it be in scientific, literary, historical, economic, social, or political context.

Developing self-consciousness concerning one's own reasoning and reasoning processes.

e.g. Being explicitly aware of the mode of reasoning being used in a particular situation. Consciously seeking to transfer to new or unfamiliar situations modes of reasoning that one has confidently used in more familiar contexts. Attacking a new problem or unfamiliar situation by asking oneself questions formed from the simplest and most concrete aspects that seem to underlie the situation.

Invoking combinations of the preceding modes and processes in the solution of problems in various subject matter areas.

The following qualifications accompany the preceding list: We tried objectively to isolate and describe reasoning *modes* and *processes* as well as levels of awareness that we see to be inextricably associated with clear thinking and with genuine understanding in various conventional subject matter areas, and, in particular, to detect processes that are common to different areas. Thus, although all the modes listed arise in the study of science, they are by no means limited to science and are also essential in at least some aspects of the study of humanities and the social sciences. In this sense the list is a description of *goals* — of capacities it is desirable that students develop as they study and learn — and not a prescription of ways of attaining the goals. It is suggested that questions as to differences in cognitive modes and styles, as well as differences between sex and ethnic groupings, arise not with respect to the reasoning capacities to be attained but with respect to the *ways* that lead to attainment. It is with respect to these ways and procedures that we need be sensitive to matters such as styles of learning; balance of verbal, visual, and auditory modes with respect to individual differences; subject matter areas most suitable as starting points for different individuals; volume, pace, and level of material that various individuals can handle.

In recent years, administration to college and university students of typical Piagetian tasks characterizing attainment of formal operations has revealed that at least fifty percent, in the broad cross section, fail completely in the performance of the tasks or perform them with only partial success. In general, these tasks probe only a few items among the capacities cited in the preceding list and do not at all probe the more sophisticated verbal-linguistic aspects. Inquiry among secondary and college teachers usually yields quick, subjective denial that many students exhibit these capacities. Yet much of the material and instruction with which we confront students in most subject matter areas implicitly assume that the capacities are either already present or that they will automatically evolve with time and with study of the subject matter.

It is becoming embarrassingly clear that such develoment actually occurs in only a relatively small proportion of our students — perhaps the upper twenty-five percent, those whom we characterize as among the "brightest." The remainder, who might develop such intellectual capacities at a slower pace, are not afforded the time to do so — the opportunity to reason slowly, make mistakes without being crushed, and to retrace their steps and revise their thinking. Under pressure of the volume and pace of material with which they are deluged, many students seek refuge in blind memorization and completely lose sight of the intellectual processes through which they could bring order into the chaos that seems to surround them.

In order to cultivate the development of the reasoning capacities we have listed, it is necessary to give students time, explicit help and encouragement, and repeated practice in all subject matter areas. It is also necessary to enhance their self-consciousness by leading them to stand back and examine in their own words the reasoning processes in which they have engaged. When this is conscientiously done, even if it be at the expense of "coverage" of subject matter, it is readily observed that students develop an entirely new intellectual stance, characterized by heightened respect for their own intellects and by pride of achievement. In consequence they begin to be conscious of the speciousness of the rewards they received in circumstances in which they were driven to memorize without understanding, and they are motivated to attack still more demanding areas of inquiry without giving up readily on encountering difficulties or temporary frustration. In other words, to quote Justice Learned Hand's ironical phrases, they become "willing to engage in the intolerable labor of thought – that most distasteful of all our activities."

Justice Hand used this line in a discussion of the circumstances under which liberties might be preserved in a democratic society. His basic thesis was the absolute necessity of a thinking, reasoning citizenry. What capacities characterize such a citizenry? The sophisticated distinction between enlightened self-interest as opposed to short range self-interest must be based on hypothetico-deductive reasoning. Such reasoning is also inevitably involved in visualizing possible outcomes of different policies and decisions in economic and political contexts concerning which one must exercise a vote. There is repeated necessity of discriminating between facts and inferences in the contentions with which one is surrounded. There is the necessity of making tentative judgments or decisions, and it is better that this be done in full awareness of gaps in existing available data, knowledge, or information. There is the highly desirable capacity to ask critical, probing, fruitful questions concerning situations in which one has no initial expertise. There is the need of being explicitly conscious of the momentary boundaries of one's own knowledge and understanding of a particular problem. Every one of these capacities appears in our list and can be cultivated and enhanced, at least to some degree, in properly designed programs embracing a wide variety of subject matter at secondary school and college levels. Thus it might be hoped that an educational framework, consciously designed to enhance reasoning capacities through interlocking experiences in all subject matter areas, and coupling these with affective development and maturation of value judgments, will be more efficient in developing liberally educated citizens and skilled professionals than most such frameworks of the present or the past.

Theme and Motif

A Dialogue

CHRISTOPHER D. KIRKLAND

The following dialogue between Dr. Arnold B. Arons, Professor of Physics at the University of Washington, and Christopher D. Kirkland, of the Phillips Academy English Department, is adapted from the transcripts of the Andover Symposium on Learning in Adolescence. These remarks, from the final session of a team discussion about cognitive development, posit Dr. Arons' reasoning modes against some approaches of one English teacher.

Kirkland: On the last paper I marked before abandoning myself to the Symposium I took apart a girl's paragraph, writing "avoid conjecture, avoid speculation" in the margins and in my comment: "Don't tell me what could have happened, or what might have happened, because that distracts you from what did happen, from what the artist is trying to make happen." Students persistently get involved in the plot and with the characters of a poem, a short story, of a novel, as if they were real, particularly in a novel; it's almost impossible to teach *Wuthering Heights.* My solution to this problem, when it gets that severe, is to say: "In every paragraph you must use the name of the author. You must not write that the hero does such and such, but that the author makes the hero do such and such."

Arons: I'm fascinated by this because you're citing a problem which comes right into these elements of reasoning. They are not discriminating between their own conjectures and what is in the document under examination. And that kind of discrimination, that kind of awareness of one's own reasoning, is one of the things I'm after in a different context. You have to press them to make that discrimination, and for a time, forbidding conjecture is an entirely legitimate, and probably necessary, way of doing it; and you separate those things.

Kirkland: You're not saying, "I'm against conjecture and I'm against speculation" at all.

Arons: I understand. I'm trying to point out the details of what you said. You're using a mechanism for making them discriminate between those levels of discourse about the novel, and these are elements of logical reasoning of the kind that I'm talking about also. I'm going to remember this one, as I need illustrations of that kind, and I think that's a beautiful example.

Kirkland: Another technique, or device, is to forbid the use of the verb "to be." Their first effort is to substitute "exists," or "seems," or any static verb for the verb "to be." And I say: "That really doesn't work." The next thing that happens is a little bit better; we get rid of the passive voice, because you need the verb "to be" to form the passive voice in almost all cases. And then they have to identify who did what. Now we're getting some returns. You can't say, "It was perceived by," you have to say "Blank perceived." "Who perceived?" "Oh, someone perceived." "Who was it who perceived?" And they begin to get an insight to what happens in literature. Then, finally, you get them to work in transposition as they edit their writing, which is the great glory and crowning achievement. If you can get them up to that level, after shoving them out onto all this thin ice, then you're in good shape. They take their sentence, they cross out forms of the verb "to be," they cross out everything that's interfering, all the static in the sentence – the qualifiers, the "very," the "pretty," the "quites" – and they're left with a couple of nouns and some indiscriminate action. They specify the noun, they make the action more vigorous. They take out loose elements spread over three or four lousy sentences. They grade every single word, on a scale from 1 to 6, to find out how much, how well each word is doing in that sentence. I tell them that each word, like an ant, must carry many times its own weight. I say "O.K., just use the honors words. Rearrange them." That's the hardest thing to get them to do. "Flop it over, reorganize the good stuff." First, get them to see the good stuff by arbitrarily making them recognize the fluff. You tell them what fluff is; you tell them that fluff is the verb "to be," and its qualifiers and so on. And eventually they can write endlessly without any forms of the verb "to be," and you say, "Fine, now you're free and you can use the verb 'to be' as much as you want. Anytime you're using it, just be able to explain to yourself why. There are good uses of the passive voice: you don't want to shift your subject, you don't want to reveal your source or change your focus, you want to make a parenthetic digression. Use the passive voice."

Arons: That's very nice, but apart from the element of intensive awareness of what one's doing, I don't see a reasoning element of the kind that I've been trying to specify in my list. This is a dealing with language which makes it somewhat different. Magnificent exercise, I love what you describe.

Kirkland: Next, I insist that unless writing makes you think, it's less than half as valuable as it should be. If writing is only a way to express what's on your mind, if it's only a beaker into which you can pour your thoughts, then it's very modest; it's not worth the effort. Writing should be ten times that, or it's no more than a gift that some people have and most people don't. If you can't learn about something, and get insight into something that you think you know nothing about, by writing about it, it's because you don't know how to write. I often encourage students to write about something that's important to them but which they know they don't understand: "O.K., put what you don't understand in the active voice. You know the verb, you know the action that's taking place. Let's identify the villain. What's making you do such and such, what's making this happen, what's motivating that?

That's called your subject." Writing ought to be a means of clarifying your own daily thoughts and impressions, and a means or tool of insight. A way to understand a poem is to write about it. If you write well, you will understand the poem, the system of good writing will make you understand that poem; and if it doesn't, then you really can't write, and you're wasting a resource. I work from a big premise: "Kids, you know so much more than you think you know. Don't sit there with blank faces. I know you know more about it, and how are we going to get at all those answers you know? Well, we're going to start writing."

A boy was supposed to write a documented report on a controversial issue, and for his first conference he was supposed to bring in all his notes on 3″ x 5″ cards, with bibliographic reference across the top, everything indexed. And he came in, off and running; he had all these *Time* magazines about troops in Korea. Then, one week later, he comes in and he's supposed to have his outline and part of his first draft done. But he comes in and says: "I can't do it, it's not a controversial issue. Everything I've discovered says there's absolutely no reason for having troops in Korea. I've got to change my topic." I said: "Nonsense." I get up to the board to outline, or to sketch his topic. I hate the linear outline and how it proceeds, so I sketch: "I, II, III, IV, V." "I" is the introduction, "V" the conclusion, "II," "III," and "IV," the body, which we're going to divide into three parts. "O.K., what are all the reasons for keeping the troops in, or for pulling the troops out of Korea?" We need three. One: Economic. Two: Diplomatic. And I don't remember three, two will do. The moral? O.K., there you see a good example. Using this process forced me to understand something about troops in Korea that at the moment I wasn't acknowledging. O.K., back to economic reasons for withdrawing troops: the cost of jeeps. Invert that to an economic reason for keeping troops in Korea. "Well, who makes the jeeps?" "Ford Motor Company." "So keeping the troops in Korea is employing not only soldiers, it's employing people in Detroit, isn't it? O.K., now just go through all those reasons for withdrawing troops, invert them, and figure out the subjects for the verbs. Go on your way, and come back with the paper." He comes in the day the paper is due, and he says: "I can't write the paper. I haven't got a controversial topic. There are absolutely no reasons to withdraw the troops from Korea." And I had agreed with this kid to begin with, I wanted the troops out of Korea. I had converted his thinking, but he had no sense of – what? Of theme, of something versus something. But the story is to demonstrate a device in teaching writing.

Arons: Yes, but in doing that writing, he had to do reasoning that he was not quite ready for. You illustrated that he was not yet at the point of being able to ask himself those abstract questions to identify the possible factors and the role these factors play. That has to come from the mind, and from the reasoning category.

Kirkland: What was frustrating, in this case, is that I couldn't make this kid switch back and forth. He should have known, from my work with his sentences, that you invert, you transpose, and you look for an answer which the transposition suggests. But he didn't. I had to tell him that, and then, once I told him that. . . .

Arons: I recognize in that student students that I have that are not ready for that, and I fail in the same way you failed. It's not something to be ashamed of. You have an elegant "how" to get at some of these things. I love what I hear, but it's not always going to work for you because some students are not ready to proceed on that basis. I come a cropper all the time on this.

Kirkland: But this boy was in a class of promoted kids. Already identified for his excellence by getting into this school, he arrives and, in two weeks, he distinguishes himself among excellent students to be promoted and advanced. Then you run into this problem. What I'm getting at is that this very block, this tunnel vision, these blinders this guy had on, were part of the reason he's as good as he is. I really debated about whether to call him well focused and intelligent, or stupid and blind. His clarity of vision was his problem.

Arons: I'm talking out of the dark, but I'd almost make a bet that some of that other good performance that he's been rewarded for is specious, that he has a facility for producing the answer the teacher wants without understanding what is behind it. There's a lot of that kind of thing going on, and I'd almost make a bet that that is involved here.

Kirkland: I was relieved that I was not continuing to teach that student's section, and I consoled myself with the thought that he was having success elsewhere, and getting good support, I suspected, in physics or mathematics. But he would have had a bumpy road with me, because I spend a lot of time teaching theme, as opposed to motif. When you identify something in a story, and you cannot identify its opposite quickly, if something opposite doesn't jump out at you, then it's a motif. You find optimism. O.K., you look for pessimism. If there's another character who's pessimistic, then you have a theme. If there are no pessimistic characters, then a motif of the story is optimism. A motif is a refrain, something that's said again and again and again, and its opposite isn't said. If its opposite is expressed, then it becomes something thematic, something dynamic, a point of tension in the story. Pick a poem or a short story that we all know, or that some of us know, or that at least I know, something familiar to you.

Arons: Swinger of Birches.

Kirkland: O.K., Swinger of Birches. Well, first you get the chronology right. What happens in Swinger of Birches? Somebody's walking. And once you begin even to paraphrase or to summarize, you're making choices and you begin to understand the poem; probably the most fundamental thing is to summarize the action of that kind of a poem. A "poet" is looking at birch trees bent into the snow, and he's saying "what makes these birch trees bend into the snow?" That's not where he says "elves," is it? He says, "I can figure that out scientifically. I can explain to you what makes those birches bend, but I don't want to think about that. I would rather think that these birch trees are bent down to the ground because a boy had swung on them. And I remember that in my boyhood I used to climb to the top of birch trees, and that I would climb and climb and climb, more and more carefully so that I wouldn't swing prematurely, and I'd get to the very top, and then I would throw my feet out, and hold on to that tree, and I would drag that birch tree down to the ground. And that's why these trees are bent down to the ground. I know that's not true, but that's how I want to think of it. I know, scientifically, that it's winter and snow."

O.K., let's look for the theme and motif. Well, there's science, isn't there? "I know how these birch trees are bent to the ground." What's the opposite of science? I'm not going to answer. You said "imagination?" I have an opposite in mind, but I say: "O.K., kids, what is in the same order as science? Something proportionate, something that balances with science. I'll know better what you think about as science when you tell me what you think its opposite is." And they'll say something that's wholly out of scale: "God." "Now, wait a minute, God and Science? Could you have a prize fight between God and Science?" Well, that's a better idea than I thought it was, but it doesn't ring right. Science versus Imagination. O.K., let me take "imagination," and now what's the opposite of "imagination," you can't use "science?" "Lack of imagination?" Maybe we need another word for "imagination." You say "short-sightedness?" O.K., short-sightedness versus long-sightedness. Now we really have something in proportion, and these two things have suggested each other. O.K., what's short-sighted, in the poet's mind? Thinking that, knowing that, stopping your thought at the knowledge, being satisfied with the knowledge that these trees. . . .

Arons: That the load of snow. . . .

Kirkland: Yes, that's being short-sighted. And what's long-sightedness? It's a recognizing of reality for what it is, but being able to be "imaginative," to get back to the vocabulary you suggested. So, I've got to write a paper about this. Well, Part I is my intro, Part V is my conclusion. Parts II, III, IV. It's a poem about shortsightedness, Part II, versus longsightedness, Part III, and Part IV will work towards a conclusion of something about the poetic imagination. And my introduction is going to be something about the observation of reality, and I'm going to write a second paragraph about all the short-sighted realities that this poem observes, showing how he transfers them into long-sighted imaginations, and to his assertion in this poem that for him "the road less travelled by," throwing in a little other Frost. . . .

Arons: Let's mix it up a little bit.

Kirkland: Yes. But earlier I was talking about an analytic kit of tools – a pair of pliers, a screwdriver, and a hammer – to take a poem apart. How do you go about providing that? Well, you use your writing. You don't let yourself be passive, you avoid being static. You use sentence structure. And you also try to label some things in that poem. Once you've got something labeled, you try to find its opposite in the poem. If you can't find its opposite, if it's recurrent, then it's a motif that characterizes the poem. If you can find its opposite, you've identified something thematic, and you can begin to block it out into a sketch and you're on your way. I feel that unless my students have confidence in that kind of gear, unless they can depend on something mechanical, that I'm teaching literature as a pipe-dream for the gifted, that some of us are imaginative and enjoy literature, and some of us don't. And that maybe exposure and practice will work if you sit there long enough, and if your teacher's pretty, if it's a nice, warm day out, maybe poetry will catch on, maybe it won't. And I just think all that is a lie.

Arons: In the enterprise you described with the poem you defined a powerful pair of concepts, and you defined them clearly and unambiguously.

Kirkland: In terms of each other.

Arons: That's right, and you gave a description of how they were to be recognized. And then you used those concepts to analyze what you had in front of you. But there's that wonderful nostalgia of the last lines.

Kirkland: "So was I once a swinger of birches, So. . . ."

Arons: "So was *I* once a swinger of birches." And that always makes something tremble in here when I hear that.

Kirkland: We work at that later. I try to say that if you don't have anything to say about a movie, a play, a poem, tell me if you like it or not. "I don't like it!" "Why don't you like it? Where don't you like it? What bugs you about it?" Or "Why do you like it? Where do you feel warmth? Why do you feel warmth about that? What word? Identify the word for it." "Love." "What's the opposite of love?" "Hate." "Is there hate in the poem?" "No." "Is that why you like it?" And so forth. But it's entirely analytic. I spend a long time trying to differentiate between analysis and interpretation. I say: "When I am asking you to analyze a poem, you may interpret if you want to, but not until you've analyzed it."

Arons: Discrimination between observation and inference.

Kirkland: I insist that first they take the poem apart and look at its pieces because everyone can do that. Only a very few people can jump right into the middle and interpret, but I know I can make every student analytic. The ones who can be interpretive naturally have an extra resource. And the ones who can't have a resource.

Arons: And the analysis part is the one that comes close to what I'm trying to talk about.

Kirkland: But if I just walk in and say "analyze this poem," they'd try to interpret it. They do not understand analysis as the opposite of synthesis.

Arons: That's right, you have to define your concepts first.

Kirkland: You have to do more than that. Again and again and again, you have to practice it. . . .

Arons: . . . to practice it, and illustrate the procedure, carry them through it over and over again. You're talking exactly the same language I've been. Analysis is one element. You want to be careful not to say that's the end and all. But you obviously consider that an important part of what you're trying to do, and that's the part that relates closely to what we've been talking about.

Kirkland: It's the one I can depend on in a group situation. I know it's going to be valuable enough to every person in that group for me to pursue. I don't have to apologize, and I don't have to say "O.K., you three, I'll take care of you later." I can say: "We're going to work with everybody, everybody's going to learn this, and we'll work more individually once we all understand this."

Arons: I would say that in giving them the practice, in establishing the ground rules and practicing analysis, using the idea of theme and motif, that as they make progress in that utilization and are analysing the poem or story more skillfully, they are in the process of cognitive development.

Kirkland: A more difficult problem is to deal with the issue of persona. "O.K. kids, is this the poet? When do you say 'Frost', when do you say 'the guy who is walking through the woods?' Is the guy walking through the woods also the kid who was swinging from birches? Is he imagining that? Isn't that an idealization? Didn't he really do that? How do you know? Is it worth speculating about?"

Arons: How do you know?

Kirkland: Is it conjectural?

Arons: How do you know?

Kirkland: You do know. What makes you think one way or the other, tell me. You say "Yes, it's Frost." "How do you know? Do you know much about Frost?" "Well, no, but . . ." "Well, you may be right. How? Let's assume you are right. I know a lot more about Frost than you do, and I'll tell you you're right. You're a whole lot right. How did you know that? Was it diction, the poet's choice of words? How did he convince you? Why does he have authority, what makes him seem authentic to you? You know that Robert Frost is a fraud, don't you?" By then you're into a wonderful realm where you get personalities involved, and it gets very aesthetic and affective, and you know how to talk about literature. That's difficult. Persona, mask – I could teach that up through graduate school. I can contribute to the best minds by talking about persona and mask. It's something that interests me, and I know that a person, whether he knows or not, has ideas about persona, that I can get to him by talking about persona. So for me, that's very effective, and that's how I would move from analysis into things aesthetic, to get at the problem of the nostalgia, and to what extent we idealize at nostalgia as an idealization of history, of our past. And on to nice, waffly things like that, the stuff we're always accused of doing. But there's something very unsatisfying about this sort of a pirouette. I feel ambivalent in talking about such devices and techniques with my colleagues in the English Department, because I don't ever want to say "this is how to do it." I'm sure that whatever way, as long as they found their own way to it, with honesty and sensitivity and purpose and dedication – that if they've really thought about it and if they're not just parroting how they were told to do it – that it will work for them, whatever it is. But when you talk about, for example, "control of variables," I feel that you're equipping a student with a volt-meter to do an electrical problem, with a very sophisticated apparatus, instead of a pair of wire clippers or a pair of pliers.

Arons: No, you're overdoing it. There are very rudimentary situations in which you must be conscious about the roles of variables, and whether they're being controlled or not. And perhaps, even in your discussion of literature, you don't get involved in that particular kind of reasoning at all; but there are other elements in there.

Kirkland: But your list, your kit of tools, is really pretty fancy.

Arons: Yes it is. Nevertheless, a major chunk of those kinds of reasoning appear immediately if you examine what sort of judgments we have to make from day to day as citizens.

Kirkland: When I think of your list of tools, I imagine the teacher as the father who can put a chemistry set under the Christmas tree. That's great, we can do that for most of the kids here, for most of them that's been done. And yet, even they still need this pair of pliers, this screwdriver, this hammer. They're rudimentary, they're all-purpose, and you've got to throw them away and get better tools when you talk about persona. You can't talk about persona even with a pair of channel-lock pliers. You need a wrench, and the wrench has got to be metric. You can't mess around.

Arons: You have to, I'll coin a phrase, inch along towards metrication.

Kirkland: Well, I don't mean to sound ungrateful, and I'm immensely flattered. But this is a pirouette, it's an opportunity to prate, and it almost seems like cheating, because it doesn't work as well in the classroom as it does with you.

Arons: Oh, I heard that in you before, and I tried to tell you that was wrong.

Kirkland: In speaking about teaching propositional logic you said that you didn't want to see it taught as an *ex cathedra* course isolated from other things, that you wanted to see the "need for it emerge out of more ordinary experience." That phrase is a very significant part of what we're talking about, isn't it; that's almost our logo.

Arons: In a sense, yes. And it underlies, in particular, the new elementary science curricula that began to be published about 1968. The whole science structure that it's providing, in the best of these curricula, is centered right on it.

Kirkland: It's certainly what I'm talking about. It's giving them a little bit of experience in the form of a poem or short story, and pointing out to them that they have the capacity, coming in from the streets, to apply whatever they use in the streets to this poem, and to extend the two to set up a dynamic between the two, between what I'd call art and life through education.

Arons: I'm entranced with what you say, and I wish I could have had your course, and I was agreeing.

Kirkland: It's all in *The Elements of Style;* E. B. White spread thin.

THIS MUCH I CAN SAY FOR CERTAIN

The expulsion of the Hyksos from the Delta,
Horses and all,
Occasioned without question
An over reliance on the priesthood
Whose god, Amon, was presumed
To have carried the day
And on the army
Who in fact carried the day
And on the scribes
Who knew where everything was,
How much, and whose.

Pharaoh still cut a fine figure
Into cliff and wall,
But the Hebrews were restive
And humdrum was here to stay;
Tomb vandalism every day
And the doubts, the doubts.

Then Akhenaton walked out into the sun
And said, "See here. See here.
    Aton is God.
    He talks to me in blazing sun.
    I will tell you everything
    In Egyptian."
And lo, in just ten short years,
His plans came to nothing.

Richard A. Hawley

THEIR TOWN

At the meeting everyone waits
for the stranger to speak
of cool arms, thighs, silk

flesh in motion. He sips
a bourbon and water, dries
his lips with a tiny paper

napkin, and says, "The average
American moves twelve times
in a lifetime." Disappointing.

They have always lived in this
damp climate, in this town,
everything's gray with mold,

shoes, power tools, children.
People are used to it. They
are quick to fill the holes

between words, when they feel
their veins turn gray. Only a
stranger might wonder how they

can cut corn and sweet clover
or watch a football float over
a goalpost and never mention

the difficult breathing, dreams
they have in daylight, how
every weekday in season the air

is clouded with falling birds.

PHYLLIS JANOWITZ

On the Hidden Treasure of Paid Attention

The Need to Know

ROBERT GRAHAM KEGAN

These days my daughter is learning to read. (You understand, of course, that when *you* talk about your children you're being a doting parent, but that when I talk about mine, I'm reporting on my longitudinal investigations. These are the privileges of being a developmental psychologist.) I watch her listening intently to her own announcement of each letter's sound. "SIH-AEH-NIH-DUH," she says, peering over these symbols, sitting still among these sounds which do not yet cohere for her. "SAAN-DUH." It is still an alien sound the way she says it, something strange and apart from her. She waits, strenuously. "SAND!" she says, arriving home.

It is not her experience I want to attend to here, but mine. The truth is I find myself terribly moved by this tiny dignity. When her forehead furls and I see her there so intent, something sympathetic flexes in my heart. She grasps a word, but somehow she grasps me as well. I could even say that I love her a little harder because of this moment. I admit some small part of me feels a bit guilty in saying so. That part chides me: "What? She has to *do things* in order for you to love her? What happened to 'unconditional regard'? And what sorts of things – the little favorites of a middle-class intellectual? And is it her effort that appeals to you or her success?"

But actually most of me does not feel guilty at all. And I think this is because however much self-congratulation might be involved, however much I might appreciate or identify with her being "successful" or "smart," and however much any signs of these might cheer me, this just does not seem to be finally what my experience of being moved is about. There is something simpler and deeper, something else. And I have felt it before, with people who aren't in any way "mine." Somehow being in another person's presence while she so nakedly and honestly and investedly labors in an activity that is astonishingly intimate – the activity of making sense – is very touching. I don't know why this touches me so. But I do know that I am not the only one who has felt it. In fact, I believe that most people have felt it at one time or another, and that all people are capable of feeling it. In a sense this experience is all that this article is about.

There is something else I know about this feeling. You and I experience it more with little people than big people. In fact, while it is commonly reported among people who spend time with children, it is uncommonly reported among people who spend time with adolescents. I do not think adolescents less frequently display themselves in these touching and elemental ways, but we are less able to see those ways for what they are. We are depriving ourselves of a wonderful experience.

But why should we care whether people who spend their lives with younger people have this kind of experience? It may be nice for them, but does it matter much for the people to whom they are responsible? The answer is that a person's life depends on whether she moves someone in this way.

I mean this even literally in the first few years of life, and every other way in all the years that follow. Our survival and development depend upon our capacity to recruit the invested attention of others to us. How does that happen? Let's start at the beginning. Nature is nowhere more graceful than in the way she endows each newborn infant with seductive abilities. I do not know why but the top-heavy appearance of the infant's body (the disproportionately large head in relation to the torso, and, concerning the head itself, the disproportionately large forehead and cranium in relation to the lower face and jaw) attracts people to it. There is a world of mystery and hundreds of thousands of years of genetic wisdom behind our experience that a baby is "cute." A baby's cute body serves to draw people to it, but someone, usually its mother, must not only be drawn but *stay*. There is no sadder or more thought-provoking material in the research on infancy than the documentation that babies fail to thrive and even die without an attachment to a consistently present caretaking person even if the babies are fully protected from hunger, cold and disease. Among the ways an infant draws another to her none is more powerful than her eyes. It is arguable that Nature had the assurance of these species-promoting relationships in mind when she linked the determinants of visual attention to discrepancy. Nowhere does the body have more contours and contrasting shapes than on the face, and nowhere is the contrast greater than the area of the eyes. A mother can be forgiven her sense that her infant is looking at the windows of her soul when the infant so quickly fixes on the dark spots that are the mother's eyes. It is hard to believe that the appeal this has for the mother, who gets hooked into looking back, is a lucky accident of Nature. A person might be a match for an infant all by itself, but in these moments the baby has on her side the most powerful ally of all. Less than eight months after she is born, the infant will make an honest woman of her primary caretaker: for now she really recognizes the mother's face as distinct from others, and, in a way that must again draw the mother closer, will find other faces distressingly strange.

This capacity to hold the mother with a recognizing eye is as fundamental to our development as the prehensile capacity to hold a physical object. It has been suggested that the human being owes his capacity for higher consciousness to his thumb of all things, that peculiar digit which can swivel itself 180 degrees and so permit the hand to hold something. The ability to grasp permits the ability to use tools or extend the natural functions of the body. This permits the ability to move outside one's body reflectively and so begins self-consciousness. What is experienced physically and concretely is later experienced metaphysically and abstractly. What is today the prehensile grasp is tomorrow the grasp of apprehension.

But I believe there are a number of similarly primordial experiences that begin in the infant's *social* world. What distinguishes these from the grasp of *things* is that they are *intrinsically* social, i.e., the "object" which is grasped is also a self, itself a grasper. None is more powerful perhaps than the glance, the interplay of eyes, the looking at someone who is looking at you. The experience of being seen and not being seen, universally acted out in the game of peek-a-boo (in Japan the grownup says, "Nai, nai – bah!" something like, "Nothing, nothing – Here I am!") is as subject to future abstracting as the prehensile grasp. The need to be seen, to be recognized, however it changes in the complexity of its form, may never change in its intensity.

The consequence of this beguiling, the infant's relationship with her primary caretaker, like that of her relationship with physical objects, is her further development, a new kind of consciousness, a qualitative growth in her making of meaning. The infant, who before regarded the world and everyone and everything in it as a part of herself becomes able to differentiate herself from others. Instead of being fused with the primary caretaker, she is now able to *relate to* her. In creating for the first time an "object world" or "other world" which *the infant, too*, sees as "other," the infant begins the history of successively joining the world rather than incorporating it, of holding the world while guaranteeing its distinct integrity, which is the history of human development.

Thus just as the object-grasping infant is doing something which, in another form, she will try to do all her life ("grasp things"), so the seductive, attention-recruiting infant is doing something she will try to do all her life (recognize and be recognized) – and at bottom it is the same thing: it is the activity of *knowing*. *Knowing*, we see, is, in its origins, a *physical* activity (grasping, seeing), a *social* activity (it requires another), a *survival* activity (in doing it we live). *Knowing*, understood in this way, is the primary human motion, irreducible. It cannot be divorced from the body, from social experience, or from the very survival of the organism. Knowing depends on someone who recognizes you. Not knowing, by definition, is utterly lonely. Well-fed, warm, and free of disease, you may still perish if you cannot know.

The reasons why we are drawn to others, especially to their welfare, are surely mysterious. But so many of the eliciting situations seem to harken back to the exigencies of this basic life motion, the activity of knowing and the threat of not knowing. We are drawn to a person in heroic struggle; we are drawn to a person vulnerably alone; we are drawn to a person who seems intensely alive; we are drawn to a person whose efforts make a kind of "perfect sense" to us. I admit to wondering if our attraction is not of some force "bigger than both of us," a kind of "species sympathy" which we do not share so much as it shares us.

This sympathy is in great supply for newborns – and newborns share a powerful capacity to elicit it. But Nature, having done her part when it is most needed, is not so democratic after infancy. The capacity to recruit another's invested regard, so uniform at birth, becomes a wildly various affair as people grow bigger. Some people have a much greater ability to recruit people's attention to them than do other people. This obvious fact, so underinvestigated by psychologists and so commonly denied by teachers, is never forgotten by teenagers. Teenagers could have told researchers *before* they spent huge sums of money discovering it that the greatest inequalities in education are not *between* schools (of different economic strata, e.g.) as *within* them, and that greater than the inequalities of social class *or* achievement test scores is the unequal capacity of students to interest others in them, a phenomenon not reducible to social class or intelligence, which seems to be the more powerful determinant of future thriving. That some people are more attractive than others teenagers know most poignantly because they have just come to discover it in a way they can name. As Janis Ian sings

> I learned the truth at seventeen
> That love was meant for beauty queens
> and high school girls with clear-skinned smiles
> who married young, and then retired
> The valentines I never knew

The Friday night charades of youth
were spent on one more beautiful
At seventeen I learned the truth

And those of us with ravaged faces
lacking in the social graces
desperately remained at home
inventing lovers on the 'phone
who called to say 'Come dance with me'
and murmured vague obscenities
It isn't all it seems at seventeen

A brown-eyed girl in hand-me-downs
whose name I never could pronounce
said 'Pity please the ones who serve
They only get what they deserve'
The rich-relationed hometown queen
marries into what she needs
A guarantee of company
and haven for the elderly

Remember those who win the game
lose the love they thought they gained
in debentures of quality
and dubious integrity
Their small-town eyes will gape at you
in dull surprise when payment due
exceeds accounts received at seventeen

To those of us who knew the pain
of valentines that never came
and those whose names were never called
when choosing sides for basketball
It was long ago, and far away
The world was younger than today
and dreams were all they gave for free
to ugly duckling girls like me

We play the game, and when we dare
to cheat ourselves at solitaire
Inventing lovers on the 'phone
Repenting other lives unknown
that call and say 'Come dance with me'
and murmur vague obscenities
at ugly girls like me, at seventeen*

* by Janis Ian, © 1975 CBS, Inc.

Some adolescents are more attractive than others, and if we don't want to talk about it, we might at least acknowledge that it has something to do with the sense many adolescents have that school and life itself is "not fair," a matter of "luck," and "who you know." But why don't we want to talk about it? The usual response is that there is nothing to be done about it, so it is better to pretend it isn't there. (This is remarkably like the usual attitude of teachers toward their own *sexual* feelings in the highly charged environment of a high school.) These kinds of attitudes contribute to the crazy-making sense in many high school classrooms that one kind of conversation and exchange is going on uptop (the polite ping pong) while down below, if you turn an ear to it, there is the thunderous roll of bowling balls. But of whom are we speaking when we say someone is less attractive? "Attractiveness" is a word that speaks to a field of interaction. If a teacher doesn't find a student attractive, is student unable to recruit or is the teacher unable to be recruited? I have asked teachers (and have done it myself while I was teaching high school) to attend for a while to whom they find themselves giving their attention and how. We usually discover we spend the most time with the same group of students with whom our colleagues spend the most time, and these very students are usually the most sought out by other students. If this is true, is the teacher, in this respect, any different from any unselfconscious person who is thrown in with a group of other people?

But I wonder if teachers should not be different, especially if they are there not simply to *follow* in the directions they first feel pulled but to do a kind of *leading out* as the very word "educator" suggests. If I am at all right that *knowing* is about a relation to the world of objects and others, that knowing is a social activity requiring recognition of others, that the very fate of a person's knowing hangs on whether she can recruit others to do this recognizing, then the issue of *the teacher's capacity to be recruited* is as crucial to the teacher's success as a facilitator of knowing as the capacity of the student to recruit others is crucial to her robust development.

Can a teacher widen his or her capacity to be recruited? I think we have probably all had the kind of experience — often one of adversity — which later allows us to understand someone we couldn't understand before. And it is our understanding of the other that makes us vulnerable to recruitment, to being moved, our recognition that the other's experience is meaningful.

In part it is my recognition of how meaningful — how full of the activity of meaning — is my daughter's effort to read the word "sand" that moves me. Perhaps the same kind of understanding of bigger people depends on some sense that the adolescent is engaged in activities which, at their own level of sophistication, are identical to the more immediately moving primordial activities of little people. Consider a couple of these; they happen at the same time, the beginning of the second year of life, and are actually related: learning to walk, the experience of dynamic balance or buoyancy, and the experience of catastrophic imbalance or collapse; and grasping a thing, retrieving a ball that has rolled out of sight, the experience of losing and finding something. These are activities of knowing, of subject-to-object relations, at a critical period in its history. For the nature of those relations *are* changing. Both activities newly practiced reflect the gradually developing differentiation in knowing which accounts for every characterization of this period. (At the heart of Freud's notion of a move from "orality" to "anality," or Erikson's "trust" to "autonomy" and "mistrust" to "shame" is this same differentiation.) These are activities of knowing, and knowing in transition, a time of separation. But this activity is not restricted to infants. It is actually panorganic, and it is certainly lifelong. There *is* life after childhood.

An adolescent is engaged in a balancing act as fragile and touching as a one-year-old learning to walk. She is learning to balance the instinctive, impulsive, demanding side of herself with the internalized controls of civilization; she is learning to balance her emerging sense of herself with the sense of herself she is beginning to discern from others; she is learning to balance her vision of a future role and set of activities for herself with the tasks, opportunities and expectations society sets for her; as an early adolescent, she is learning to balance her loyalty to her own needs, interests and desires with her emerging loyalty to the preservation of interpersonal relationships and the kinds of compromises and mediations they require; in later adolescence she is learning to balance her loyalty to interpersonalism with her emerging loyalty to the maintenance of a group or social order and its code of which she begins to feel a part.

An adolescent is engaged in an activity of finding and losing the object that, in its own terms, is identical to the year-and-a-half-old child who is gradually able to retrieve a ball after it goes under a blanket. The infant's vacillation and tenuousness is evidence of its only-emerging ability to differentiate itself from the ball and recognize that although it is out of sight, it still exists. The adolescent, too, is engaged in a process of redefining her object-world which, too, is a matter of losing and finding. She differentiates herself from her family and gradually, tentatively, finds new others, especially peers. She loses the sense of the concrete world, the "actual," and "the physical" as the ultimate and totality of experience, and gradually, tenuously, she finds the abstract world, "the possible," and the "*meta*physical." In early adolescence she loses others as satisfiers and fulfillers of her own needs (marketplace cooperators) and slowly finds them again as partners for mutuality (chums, collaborators). In later adolescence she loses her dependence on (and comfort from) others who will define her and very gradually, tentatively, becomes the guarantor of her own identity.

While I am suggesting that it may be helpful for people who work with adolescents to know some of the particulars of an adolescent's own efforts to walk or retrieve a lost object, it is not so much this kind of *information* that seems to me to make the difference as the *conviction* that would lie behind a person's wanting the information. I do not believe it is as crucial to know immediately what a person's actions mean as it is to explore the possibility that they *are* meaningful expressions of the actor's integrity. This carries us beyond the piety that "we have to take people where they are" into the more radical assumption *that* they are, that they are alive and therefore *knowing*, and in some way which anyone who would seek to engage their knowing might try to understand. A child learning to walk or read can move us, draw us to her, in part because the behavior is so immediately meaningful to us that the intensity with which it is carried out affects us as an expression of the little person's dignity. The "con man" manipulations of an early adolescent finessing the authority of the teacher usually does not move the teacher much (except to irritation), and its persistence is seen not as an expression of integrity but intransigence.

Since I began with a story of a little girl learning to read, let me conclude with one about a con man, actually a con woman, someone else's daughter. I met Terry, almost sixteen, on a psychiatric ward where her exasperated parents had just brought her. The parents were not beastly or even unsympathetic, but they had come to an end with their daughter, whom they could not control. The final blow had come that week when the mother called the school to discover that her daughter had skipped. When Terry returned home at the appropriate afterschool hour and was confronted with the mother's information, Terry flew into a rage at what she regarded as her mother's intrusiveness and demanded that her mother give her her bankbook so that she could run away. When her mother refused, Terry took twenty dollars from her mother's purse and barricaded herself in her room. When the mother forced entry, Terry escaped through a window and led the mother, assorted allies, and eventually the police on a seven-hour chase which Terry tells us about in the hospital with glee. On the checklist at admission Terry's mother describes Terry as "bright," "egocentric," "narcissistic," and "manipulative." Terry characterizes her mother as "stern," "strong," "stubborn," "nagging," "unwilling to compromise," and "headstrong."

In the hospital, where group therapy and participation in the life of a ward community are the primary media of treatment, Terry is having a terrible time. She can be seen in group meetings struggling unsuccessfully to talk about herself in a way the staff will approve. When she says in many different ways that "my problems are not mental; they have to do with getting along with my family," the staff, however gently and indirectly, is not satisfied with the formulation and takes it as resistance to deal with herself, her own feelings and responsibilities. The staff can see that when she does speak the language of internal reflexivity, she is doing so by triangulation, or imitation, that she is not really speaking her own voice; this, too, they take as a kind of slipperiness or dishonesty. Their exasperation with her grows, and when it is discovered both that she spoke to people outside the ward about people inside the ward (a cardinal violation of patient-patient bonds) and that she used "unprescribed drugs" during a weekend pass (a violation of patient-staff bonds), the staff throws her out of the community ("precipitously discharged"). They understand her behavior as hostility and acting out, and they justify their own on the ground that she "would not do the work of the ward," "was argumentative," "was disruptive," "was inciting to other patients" and "was a staff-splitter." The staff was pretty mad at Terry.

Now I think it is fair to say that no one – not her parents or an outstanding professional staff – was drawn to Terry at sixteen in a way they might have been moved by her struggle to walk at one or read at five. It would *not* be fair to say that no one loved her. I believe her parents love her very much, and that some people at the hospital stood ready to pay her a kind of attention I would not be uncomfortable calling a species of love. But love comes in *shapes* as well as *intensities;* it has a way of seeing or not seeing, which can never be made up for by the depth or sincerity of caring that accompanies it. It is this seeing, this paid attention, that is the hidden treasure. Terry's parents love her, and the hospital was ready to care for her, but she was unhelped because no one could feel moved by or attracted to her. On the contrary, people found her, totally and figuratively, revolting. People are moved, we have said, by heroic and vulnerable expressions of dignity and integrity, and no one could see these qualities in the way Terry lived her life.

The kind of "research" my colleagues and I do consists in an awkward and laborious process bent on discerning the nature and state of the very meaning-making, or *knowing*, about which I've been talking. Lately some of us have begun these explorations with psychiatric patients, especially to see if what passes as disease or illness in some quarters might not be better understood as the suffering which can be a feature of *knowing* in the process of transforming itself, upheavals akin to *not* being seen, *losing* the object, and being *out* of balance. From our systematic conversations with Terry, a researcher who had no familiarity with her pre-hospital history or her experiences on the ward was able to see that Terry was only beginning the differentiation from her own needs and wishes that would eventually permit her to invest her loyalty in the strictures and benefits of interpersonal relationships. The feeling of losing others as satisfier and guarantor of her own satisfaction was still so staggering that the possibility she might recover others again as partners in an interpersonal world was at the moment beyond her ken. High I.Q. notwithstanding, Terry's developing "biologic," the evolution of her meaning-making, was poised at a precipice more familiar to persons three and four years her junior. In fact, her I.Q. and verbal dexterity only exacerbated her predicament since other people felt justified in counting on Terry to know them and herself in a fashion appropriate to her age.

Seen in this light, I wonder if Terry's behavior, so inciting to those around her, does not begin to take on a different cast. I wonder if her "manipulation" is not, at the same time, the universal effort of all organisms to order and regulate their relations to the environment. It is just that the limits of her regulating are such as to make it impossible for her to hold "the other" interiorly or imaginatively (the shared reality, the essence of mutuality) so that she must seek to hold and regulate the other externally. I wonder if her violations of group rules are acts of defiance and hostility (which presumes she shares a sense of their rightness and defies them) or whether the benefits and purpose of meeting the other's expectation when it interferes with one's own interests are lost on her. I wonder whether her inability to speak reflexively about her "problems" is a resistance, or an accurate reflection of the way she makes sense of herself. And I wonder if in fact she did not speak with poignant precision to the staff on the agony of the very transition she is undergoing when she said, "I don't feel like a whole person anymore; it's like others are woven into me!" I begin to wonder if the exasperation of Terry's parents and the staff does not spring from their disappointment at not being known (not being held, grasped, seen, found, balanced with) in the way they expect. And I begin to wonder if a form of treatment for Terry which presumes *at the outset* that very capacity (to be a member of an interpersonal community) which is actually her growing edge, is not in the end a form of cruelty.

This is not to suggest that Terry's behavior should go unassailed. It is to suggest that before someone deals with her behavior, someone must see her. It is to suggest that her behavior is the vulnerable and heroic exercise of her integrity. "Integrity" seems the perfect word here, as it has a biological as well as a psychological meaning, and both are intended. It is to suggest that when I feel recognized and have a sense that you understand how I am experiencing my experience (whether this is how you experience it or not), I can find your limit-setting tolerable and even a relief; if I do not feel recognized, I resent it as a violation of who I am. Which is just what it is.

The risk I run in understanding Terry is not that I will lose my sense of the harmful or destructive nature of her behavior or paralyze my efforts to be of help to her in changing it. The risk I run is that in seeing her for who she is – intent there, brow furled, sounding out the letters of a half-perplexing sign – I will be moved by her. Our lives depend on someone running this risk.

DAUGHTER

— from the waiting room

Just now you drift
through me like fog
that vanished from
the inner harbor
yesterday; you are
still here hiding in
clear air curling
my hair, oiling
my skin, and soaking
my lungs as surely
as when first I lay
my face alongside
your mother and felt
the current of your breath.

RANDALL PEFFER

CHARLIE DEAN

PAMELA CARTER

A Skeptical Consumers' Guide to Educational Research*

DENIS C. PHILLIPS

There are, no doubt, many grounds on which the work of educational researchers can be criticized, and indeed it is the purpose of the present paper to highlight some of these. But at the same time, it is important to recognize that some criticisms of research are unfair. Thus, educational researchers are sometimes criticized for not tackling the major issues of our times. During 1976-77, to take a prominent example, three hundred of the twenty-seven thousand teachers in the Los Angeles Unified School District were reported as having been assaulted, and presumably there were many unreported cases. The figures showed a 16% increase for the first part of the 1977-78 school year. Over the same period, there was national publicity about the declining S.A.T. scores of prospective college entrants; and the inability of high school students to read and write was touted in *Newsweek* and elsewhere. A cynic might suppose that educational researchers were kept busy accurately documenting these horrors, and unfortunately had little energy left to seek out solutions.

This cynical position is, of course, unfair. Many of the problems that plague the schools are not in the first instance educational problems; they are social problems that have invaded the classroom, and it is unlikely that solutions will be forthcoming by making adjustments to the school system. Vincent Fontana made a similar point when reporting on the work of the mayoral task force on child abuse in New York City, which he chaired:

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* Numerous discussions with my graduate teaching assistants, Jennie Nicolayev and Nancy Sanders, have contributed to the development of ideas in this paper.

> Child abuse is a symptom of the violence running rampant in our society today. It is inextricably linked with unbearable stress, impossible living conditions, material or spiritual poverty, distorted value, disrespect for human life, drug addiction, alcoholism, assaults, armed robberies, murders and other ills in the midst of which we live – and for which we must find massive healing.[1]

The same point, too, is often made by neo-Marxist writers on education, who see the school system as merely one facet of society which is relatively powerless to institute radical reforms. As society goes, so go the schools – and not vice-versa.[2]

So the point must be granted that it is unreasonable to expect educational researchers – armed with expertise in statistics, psychological testing, experimental design, interviewing techniques, and the like – to solve many of the problems that face the nation's schools. It is more reasonable to inquire what issues researchers *can* pursue, and then to see if, in fact, reliable and pertinent findings have been uncovered.

It would not be seemly for the present author, who is affiliated with an institution whose *raison d'être* is the training of educational researchers, to attempt to encapsulate the world of current research in a few pages, and no attempt will be made to summarize the lines contemporary work is taking. But it is possible to offer some cautionary remarks about how research findings ought to be interpreted by consumers, whether these results come from psychologists on such things as learning theory or the stages of cognitive or moral development, or from sociologists investigating structural effects within schools or social class influences on scholastic attainment. In other words, while it is illegitimate to criticize researchers for not doing what they cannot do, it would seem to be eminently fair to closely scrutinize what they do attempt to do in order to see if it can withstand the skeptical eye.

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[1] Vincent Fontana, reported in the *S. F. Sunday Examiner and Chronicle*, "This World," May 28, 1978, p. 2.

[2] See, for example, M. Carnoy and H. Levin, *The Limits of Educational Reform* (N.Y., David McKay, 1976).

In accordance with this fair principle, then, the following discussion will focus on several issues about which skepticism seems particularly warranted: research with universal pretensions; the limits of statistical methods; trivially true research; the problem of the suppressed premise; and the is/ought dichotomy. Throughout, a small number of running illustrative examples will be used — examples that are no doubt familiar to the reader through their rising educational influence; these examples do not exhaust the realm of educational research, but it is hoped that they will serve a useful purpose. Obviously, too, the discussion is not encyclopedic, and many limitations of research which ought to be discussed have not been focused upon.

Research with universal pretensions

Some research, but of course not all, is aimed at establishing universal conclusions. Among notable examples of this genre are the work of the Piagetians on the stages of conceptual development that are passed through by all children and the related research of the Kohlbergians on the stages of development of moral reasoning. Both theories — or rather, both sets of theories, or research programs[3] — aim at explaining development of *all* children, not just Swiss or American youngsters. And both programs are becoming increasingly influential in schools; much curriculum development nowadays tries to take account of Piagetian findings, and there are programs in the field of moral education based on the work of Kohlberg and his associates.

The point about any such research program that stimulates a skeptical response is a simple one: a universal conclusion of the form that "all X are Y" is very strong, and it is not clear what sort of evidence could *ever* fully warrant it. It has long been realized by philosophers of science that even if all cases of X up to the present have also been cases of Y, this does not substantiate the claim that all future cases of X will also be Y. In philosophical circles, this is known as Hume's problem, or the problem of induction. The most that can be said is that if all cases of X to date have been Y, then this makes the claim that "*all* cases of X are Y" probable to some degree (but it is not clear *how* probable).

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[3] The theories of Piaget, Kohlberg, and their co-workers have not remained static over time. The terminology "research program" indicates something of the dynamic quality; it is due to the work of the philosopher of science Imré Lakatos.

The problem for educational and psychological researchers, however, is compounded by further factors. In the first place, it is not the case in educational research programs that *all* cases of X up to the present time have been studied. Piaget has studied only a small number of children, including his own; and Kohlberg's universal claims concerning the stages of moral reasoning were based, in the first instance, on a sample of seventy-two boys in Chicago he studied while doing his doctoral work in 1958 (and much subsequent work has, in fact, been longitudinal work on the same sample).[4] Unfortunately, perhaps, the total number of human youngsters somewhat exceeds the seventy-two male Chicagoans alive in 1958!

The second, and fatal, difficulty is that even in the small number of cases that have been studied, it usually happens that *not* all cases of X are also Y, thus obviously refuting the universal claim that "all X are Y." Consider an example from an early paper by Kohlberg on cognitive stages and pre-school education: he was illustrating his viewpoint that the stages of development are always in an invariant (that is, *un*varying) order, and he used the example of the development of the concept of a dream in a sample of ninety children to make his universal claim. He wrote that "if there is an invariant order of development . . . all children should fit one of the patterns. . . ." Then, in a striking passage, he went on to report his evidence:

> The fact that only *18 out of 90* children *do not fit* one of these

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[4] A thorough technical critique of the Kohlbergian research is to be found in William Kurtines and Esther Greif, "The Development of Moral Thought: Review and Evaluation of Kohlberg's Approach," *Psychological Bulletin,* vol. 81, no. 8 (August), 1974.

> patterns *is acceptable evidence* for the existence of *invariant sequence* in the development of the dream concept.[5]

In a situation where one negative case out of ninety would be sufficient to refute the universal claim that was being advanced, the ignoring of counter evidence that totals twenty percent of the sample should be enough to confirm the average consumer's skepticism.

The work of Piaget and his colleagues does not seem to be so blatantly faulty, but even here there is considerable controversy. Many researchers have been struck by the replicability of Piaget's classic experiments: when a group of children (the Xs) are studied in the way Piaget describes, they do all appear to react in the way that he said they would (the Xs all appear to display Y). This universality, however, is challenged if the experiments are repeated using more rigorously scientific controls; for example, Peter Bryant at Oxford reports obtaining the opposite results to Piaget when the studies are done under tighter conditions.[6] There are some grounds, then, for the skeptic to conclude that possibly the only universal generalizations to be found in the human sciences are the ones uncovered centuries ago by Dr. Johnson – the only things certain are taxes and death.

The limits of statistical methods

The foregoing discussion leads naturally to the next point warranting skeptical attention: many of the "human sciences" are heavily statistical in orientation, and their research results are, at best, probabilistic. A typical situation, especially in educational research, is the following: a population of interest is identified (all adolescent math students, for example), and because it is not feasible to study *everyone*, a sample is taken following one of several standard procedures. Two groups are established at random, and after pre-testing, one of these is given the "experimental treatment" (such as, a new method is used to teach a particular mathematical concept) while the control is "untreated" (or, rather, taught by the regular method). A post-test is administered. It may turn out that the experimental group's scores have improved more than those of the control group, in which case (if the gain is sufficient) the new treatment is judged to be a success.

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[5] L. Kohlberg, "Cognitive Stages and Preschool Education," *Human Development,* vol. 9, 1966, p. 11. (My emphasis). This and other defects in Kohlberg's work are discussed in D. C. Phillips and Jennie Nicolayev, "On Assessing Kohlberg's Stage Theory of Moral Development," in D. Cochrane, C. Hamm and A. Kazepides (eds.), *The Domain of Moral Education* (in press).

[6] Peter Bryant, *Perception and Understanding in Young Children* (N.Y., Basic Books, 1974).

A problem arises from the fact that not all members of the experimental group (or of the control group) will profit – or suffer – to the same degree. Some members of the control group will profit from the way they are taught to a greater degree than will some of the experimental group, and vice versa. The results showing that the experimental group's scores have improved more than the control group's are the group *averages*. The benefits of the treatment obviously are not clear-cut.[7]

The next issue that arises, then, is whether the average gain by the experimental group represents a real average gain or whether by chance the experimental group was composed in such a way that its average was higher even though the experimental treatment was in fact no more efficacious than the regular treatment. To answer this question – or rather to give guidance, for the question can never be answered absolutely – a statistical test of significance will usually be performed, and if the odds seem high enough, it will be concluded that the difference between the experimental and the control groups is a real, rather than a chance, difference.

There is a host of complex issues here. The statistical procedures themselves are often misunderstood or misinterpreted, and there is a growing body of critical literature that points out, among other things, that statistical significance is *not* a measure of how much confidence we can have that the experimenter's hypothesis is correct (if only we *could* have calculated how much faith to have in the hypotheses of a Newton or Einstein or Darwin or Jensen, a great deal of trouble would have been averted). Technically, the test only gives information about the *sample.* A typical statement on the evils of significance testing and the like comes from the psychologist and methodologist David Bakan:

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[7] The recent work of Lee J. Cronbach and Richard Snow shows that the same treatments affect students with different aptitudes or characteristics in a differential fashion. For references, and discussion of other difficulties facing social sciences research, see D. C. Phillips, "Forty Years On: Anti-Naturalism and Problems of Social Experiment and Piecemeal Social Reform," *Inquiry,* 19, 1976, pp. 403-25.

> The vast majority of investigations which pass for research in the field of psychology today entail the use of statistical tests of significance. . . . I will attempt to show that the test of significance does not provide the information concerning psychological phenomena characteristically attributed to it; and that, furthermore, a great deal of mischief has been associated with its use. If the test of significance does not yield the expected information concerning the psychological phenomena under investigation, we may speak of a crisis; for then a good deal of the research of the last decades must be questioned.[8]

To help the neophyte understand (or, cynically, to help him or her misunderstand) the statistics, researchers often provide a verbal gloss. A nice series of examples once again can be taken from the work of the Kohlbergians on moral development.[9] As is the case in other behavioral research, the results of the Kohlbergians' work are probabilistic in nature – the figures (at best) illustrate that *trends* are present, trends that may or may not be statistically significant. The results never show that *all* experimental subjects reacted in exactly the same way and to the same degree. And so we come to a recent paper in the *Harvard Educational Review* by John Gibbs, one of Kohlberg's co-workers. In a brief section titled "A Research Review," a section notable for its lack of hard data, Gibbs reported on the available literature in glowing terms such as:

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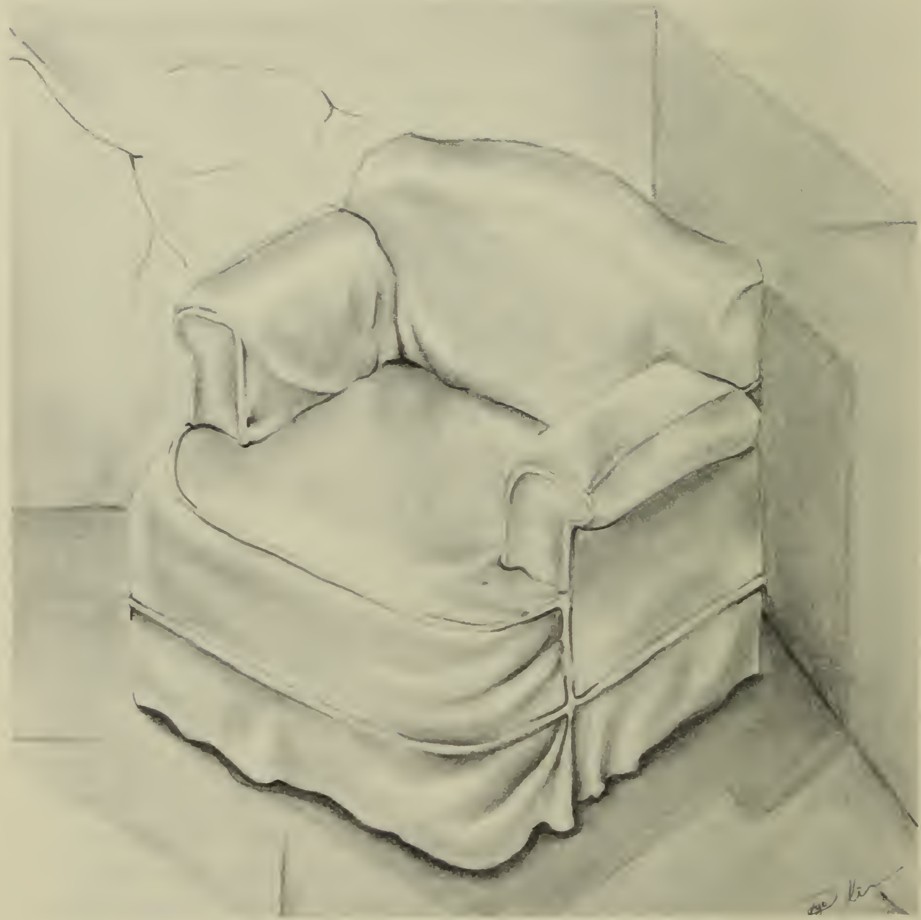
[8] David Bakan, *On Method* (San Francisco, Jossey-Bass, 1969), Ch. 1, pp. 1-2. This chapter, and some thirty other papers on this and related topics, is reprinted in Morrison and Henkel, *The Significance Test Controversy.*

[9] The example that follows was taken from D. C. Phillips and Jennie Nicolayev, *op. cit.*



BYUNG-PYO KIM

"were much more likely" (without saying how much more likely), "markedly amenable" (without saying how markedly or how amenable), "found greater change in the upward direction" (without saying how much greater, or how reliable the findings were, or how much change was found in the reverse direction), "found significant upward change" (without saying how significant), "found positive correlations" (without saying how positive), "has generally supported the hypothesis" (without saying anything about the support which by implication was found for the counter-hypothesis as well).[10] Kohlberg himself sets a high standard with respect to glossing the statistical difficulties, and his writings are replete with statements of the following type:

> Over a period of almost twenty years of empirical research, my colleagues and I have rather firmly established a culturally universal invariant sequence of stages of moral judgment. . . .[11]

The consumer's skepticism is further heightened by the fact that two independent researchers, reviewing the literature afresh, reached a somewhat sobering conclusion from the same statistical evidence:

> Not only is there no clear-cut evidence supporting the assumption of invariance of stages and their hierarchical nature, but there is also evidence suggesting that these assumptions may be incorrect.[12]

Nor is this situation unusual; it often happens that data collected and analyzed by one team of researchers is re-analyzed, with different results, by another team. Indeed, the evaluation data from the *Head Start* program has been analyzed *three* times, with different conclusions being reached on each occasion.

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[10] John C. Gibbs, "Kohlberg's Stages of Moral Judgment: A Constructive Critique," *Harvard Educational Review*, vol. 47, no. 1, Feb. 1977, pp. 48-9.

[11] L. Kohlberg, "The Claim to Moral Adequacy of a Higher Stage of Moral Judgment," *Journal of Philosophy*, LXX, Oct. 1973, p. 630.

[12] W. Kurtines and E. Greif, "The Development of Moral Thought: Review and Evaluation of Kohlberg's Approach," *Psychological Bulletin*, vol. 81, no. 8, August, 1974, p. 469.

Trivially true research

Consumers of educational research are often struck by the fact that the conclusions presented to them are not particularly startling – the researcher often seems to have settled upon something rather obvious. Sometimes this comes about because the research is, in philosophical jargon, trivially true; that is, it is true by definition, or true by virtue of the meaning of the key terms involved. An example would be a piece of research that led to the conclusion that "close-minded" people are less likely to change their views than "open-minded" people.[13]

Sometimes, of course, the triviality may be disguised, but an alert consumer should still be able to detect it. An example is the work on learning hierarchies by Robert Gagné and his co-workers, work which again has had impact on curriculum construction.[14] Gagné approached the problem of human learning from the point-of-view of determining the prerequisites for specific learning tasks (such as, the learning of a mathematical operation – perhaps the solving of complex multiplication problems using logarithms). Thus, item A might be a prerequisite for learning item B so that B can only be mastered after A; but then B itself may be a prerequisite for C, and C for D, and so on up a hierarchy. Gagné introduced his theory of prerequisites for learning in the following way:

> From where does the student begin, and where is he going? What are the specific prerequisites for learning, and what will he be able to learn next? . . . What is meant by 'prerequisite' is not that fourth-grade social studies must precede fifth-grade social studies. Rather, the meaning is that learning to pronounce foreign words must precede learning to use them in sentences; or that learning to count numerically must precede learning to add numbers.[15]

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[13] My informant guarantees that this is a real example!

[14] This example is taken from D. C. Phillips and Mavis E. Kelly, "Hierarchical Theories of Development in Education and Psychology," *Harvard Educational Review*, vol. 45, no. 3, August, 1975.

[15] Robert M. Gagné, *The Conditions of Learning* (London, Holt, Rhinehart & Winston, 2nd edition, 1973), p. 26.

Now, it is trivially true that one cannot speak a foreign sentence if one cannot speak any foreign words; this follows from the meaning of the term "sentence" – it is, by definition, something composed of words. Similarly, it is trivially true that one cannot solve mathematical problems using logarithms if one cannot first do addition, for part of the procedure involved in logarithms is adding. The skeptic begins to wonder why Gagné and his co-workers feel impelled to do experimental research on these trivially true issues.

These examples also show that information that is trivially true may nonetheless be useful. It is useful for math teachers, for example, to be reminded that students who have trouble with addition will also (and as a necessary consequence) have trouble with logarithms. It is important, however, that such information be recognized for what it is; and when researchers spend large amounts of time and money in seeking out such trivially true items and in "verifying" them experimentally, and then announce them as great discoveries, the pennywise consumer is entitled to be a little chagrined.

The problem of the suppressed premise

There is a gap between the world of fundamental research in the sciences and the everyday world in which human activity takes place. The researchers use sophisticated techniques and specialized apparatus, and their world is a theoretical one which is populated, perhaps, by such quaint entities as quarks and quantum leaps; such crass things as tables and chairs do not appear in their universe of discourse.[16] The findings of such research, then, do not automatically apply to the everyday world. Links of some sort have to be established – premises linking the quarks or quantum leaps (or the findings associated with these) to tables and chairs or whatever.

To take a simple illustration pertinent to the field of education:

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[16] For a lively discussion of this issue, and a strong attack on several noted scientists who confused the technical with the everyday language, see L. Susan Stebbing, *Philosophy and the Physicists* (N.Y., Dover, 1958).

from the fact that a Piagetian researcher reaches some conclusion about *decalage* with respect to certain conservation tasks in pre-operational children (children between the ages approximately of 2 and 7 years), the "implication" does not logically follow that a teacher working with appropriately aged children ought to do certain things. The Piagetian theory does *not* have built-in as part of its conceptual apparatus the teacher, or classrooms, or particular school curriculum content. To apply the Piagetian findings to the classroom, some link has to be provided – for example, it has to be shown that conservation, decalage and so forth are relevant issues for teachers, and that no other factors ought to outweigh these in deciding classroom practice (*i.e.*, political or moral or financial or cultural or other psychological factors are less important in deciding what the teacher should do than are the Piagetian findings).

At this point a further complication arises. It is possible for several different people, who accept the same theoretical position or the same set of research findings, to differ with respect to the "implications" for practice. This happens because these people have different sets of linking premises and assumptions.[17]

The final complication is that many researchers do not realize that linking premises are involved in applying their theory or research findings to practice and therefore do not state them clearly. In other words, the links – which may be open to challenge, or for which alternatives may be found (thus leading to different practical implications) – often are suppressed. An example, involving the currently fashionable research on the different functions of the left and right hemispheres of the human brain, appears in a recent volume of the *Phi Delta Kappan.* The author, Leslie A. Hart, reports on research as to how various parts of the brain process information, and he writes (with his own emphasis):

> *The processing depends little on what or how the teacher has presented, and greatly on the total, previous stored experience in that particular brain.* Thus the standard presentation, lecture, reci-

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[17] For further discussion, and examples, see D. C. Phillips, *Theories, Values and Education* (Melbourne, Melbourne University Press, 1971), Chs. 1, 2.

> tation, and discussion that take up most of the instructional time in classrooms cannot be expected to produce learning in any reliable way.[18]

As it stands, this is a classic *non-sequitur*. The only premise stated is about information *processing*, while the conclusion is about reliable *learning*. Obviously there is a missing premise that in some way links processing and learning. A little reflection raises the suspicion that such a premise would not be particularly credible. (To take a simple analogy: how a hand-held electronic calculator processes information is one matter, and it is determined by the "wiring" within the instrument, while the problems the calculator are used for, or which finger the operator uses to punch the information in, and so forth, are quite other matters. Furthermore, different brands of calculators process information quite differently – "reverse Polish" versus "algebraic" – and yet they can master the same tasks!)

The is/ought dichotomy

The consumer of educational research would be wise to be alert for a particularly invidious special case of the suppressed premise. Research findings take the form, roughly, of "X is Y," or "the probability of an X having the feature Y is p"; in other words, they are statements of the "is" form (or one of its locutions, such as "all X are Y"). On the other hand, implications for practice take some such form as "person A ought to do Z to person B"; in other words, they are statements involving an "ought" or "should" or some other locution involving the passing of a value judgment. But it is a point of logic that from statements only involving the use of "is," a conclusion involving "ought" or one of its locutions cannot validly be deduced.[19] Linking premises, involving value judgments, must be involved, whether the researcher is aware of them or not.

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[18] Leslie A. Hart, "The New 'Brain' Concept of Learning," *Phi Delta Kappan*, vol. 59, no. 6, February 1978, p. 394.

[19] There is some debate among philosophers about special cases in which an "ought" might follow from an "is," but the point in this present paper is not affected. See W. D. Hudson (ed.), *The Is/Ought Question* (London, Macmillan, 1969).

And as was the case with other suppressed premises, these linking value premises or assumptions can often be challenged, or rival value premises may be found.

A hypothetical, but nonetheless realistic, example can serve to illustrate various points made in the last two sections.[20] Suppose that a psychologist of Piagetian orientation found that the concepts involved in understanding the National Anthem could not be mastered by children until they reached the "formal operations" period of development (approximately at the age of eleven). What would be the "educational implication" of this psychological discovery?

It might be thought that the implication is clear-cut: that the National Anthem should not be taught until children are about eleven. But this conclusion is *not* implied by the psychological discovery taken by itself. Certainly it is *compatible* with the discovery, but the policy of not teaching the National Anthem follows from the psychological discovery only if it is assumed (the hidden value premise) that children should only be taught what they can understand – that they should never be required to memorize material that is meaningless to them. Put more formally the line of argument is:

Psychological theory or finding:	Children under eleven cannot understand the National Anthem.
Suppressed value premise:	Children should not be required to learn what they cannot understand.
Conclusion (or policy implication):	Children under eleven should not be taught the National Anthem.

Now it is clear that the value or linking premise in this argument is one that can be challenged, and it is possible that other linking premises could be substituted in its place, leading to a different "educational implication." Thus, many people feel that the benefits of knowing the words of the National Anthem (such as the emotional thrill of participating in singing it, or the social cohesion that it produces) far outweigh the fact that young children will not understand the words. The more formal expression of this argument would run:

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[20] This example is based on D. C. Phillips, *Theories, Values and Education,* Ch. 2.

Psychological theory or finding:	Children under eleven cannot understand the National Anthem.
First linking or value premise:	Children should be required to learn things they do not understand only if there are sufficient benefits to warrant this teaching.
Second linking premise:	There *are* sufficient benefits to warrant teaching the National Anthem.
Conclusion (or policy implication):	Children under eleven should be taught the National Anthem.

The moral of this discussion is simple: if a researcher tells his or her consumers that they ought to do certain things, the consumers in return ought to demand to inspect the researcher's line of argument and pay particular attention to the linking value premise or premises that must exist.

No greater service can be rendered to the consumers of educational research than to advise them to be cautious, and not to believe all that they are told (not that everything they are told is wrong, of course). And it would be as well to commit to memory the words of William James, who with his eminent good sense summed it all up so well so long ago:

> I say moreover that you make a great, a very great mistake, if you think that psychology, being the science of the mind's laws, is something from which you can deduce definite programs and schemes and methods of instruction for immediate schoolroom use. Psychology is a science, and teaching an art; and sciences never generate arts directly out of themselves. An intermediary inventive mind must make the application, by using its originality. . . .[21]

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[21] William James, *Talks to Teachers on Psychology* (London, Longmans, 1925 impression), pp. 7-8.

FOUND POEM

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On pages 65-66 and thereafter,
constant references to sex
and much laughter.
Final pages still uncut;
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Small folio, hand sewn.
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MARILYN R. MUMFORD

The Hungry Student

JOAN S. LIPSITZ

> Before speaking further about culture, I must remark that the world is hungry and not concerned with culture, and that the attempt to orient toward culture thoughts turned only toward hunger is a purely artificial expedient.
>
> What is most important, it seems to me, is not so much to defend a culture whose existence has never kept a man from going hungry, as to extract, from what is called culture, ideas whose compelling force is identical with that of hunger.
>
> We need to live first of all, to believe in what makes us live and that something makes us live – to believe that whatever is produced from the mysterious depths of ourselves need not forever haunt us as an exclusively digestive concern.
>
> I mean that if it is important for us to eat first of all, it is even more important for us not to waste in the sole concern for eating our simple power of being hungry.
>
> Antonin Artaud, *The Theater and Its Double*

Chris Kirkland of Phillips Academy has led me through Artaud's concept of hunger by substituting "education" for "culture" in the quotation above. It is his concern, as a talented teacher of adolescents, "to extract, from what is called [education], ideas whose compelling force is identical with that of hunger." That is a curricular concern, and an essential one.

My approach to "hunger" is a developmental concern which precedes curriculum. Adolescence is a hungry time. We know this in the literal sense from those teenagers who raid the refrigerator and eat us out of house, home and budget. Adolescence is also a keenly yearning, seeking time. It is a time of emotional and social "hunger" whose "compelling force" can have the power of a quest.

Adolescents seek, for the first time in their lives, to form a commitment to self and others. Having begun the tasks of separation and individuation, they are aware of a self, a self with a personal and social destiny. Never before have they felt the implications of a future. They are hungry for friends, solitude, adventure, ideas, newness, continuity.

It is when the quest turns against self or society that we become aware of it. Adventure becomes danger. The thrust toward separation reaches beyond associational autonomy (rejecting the company of parents) to normative autonomy (rejecting the values of parents). The sense of self becomes overwhelming. Solitude becomes loneliness. Newness is alien, change disruptive. Emotional hunger, unrequited or unappeased, feeds on self or others. Then we know its force.

We must come to know its force without pathology. It is during early adolescence that the questing begins. Because so many types of growth are occurring at once – physical, emotional, social, intellectual – and so much remains unresolved during early adolescence, "the simple power of being hungry" can confound teachers and curriculum alike. There is no other time in the continuum of schooling that teachers face such variability in one classroom as they do in the junior high years. There can be a five or six year difference in biological age between a quickly maturing girl and a slowly maturing boy of the same chronological age. Intellectually, some students are dealing easily with abstractions like theorems and themes while others cannot get beyond figures and facts. (I am referring here not to intellectual ability but to intellectual maturity, à la Piaget.) These are but two examples of "age." When we consider all the ages which one young adolescent is at once – biological, social, emotional, intellectual, academic, legal – and then consider the possible combinations and permutations of ages in a class of 25 to 30 students; it is little wonder that junior high school teachers feel defeated. In fact, they often mistake this wildly variable but normal growth and individuation for mass pathology.

Teachers cannot rearrange their students' development. They cannot, by fiat, will all these ages into synchrony. It is a lesson which comes hard to school people, but we must learn to rearrange institutions to fit young people. Even were it desirable to do the opposite, it is not possible. Growth and development are inexorable. We know this to be true when we arrange space and time for pre-schoolers. We look at their developmental needs and characteristics first, then fit schedule and curriculum to them.

Pre-schoolers cannot sit still for long periods of time. They have short attention spans. They need access to bathrooms and water fountains at their level. They need appropriate outlets for creative and physical exploration. There is nothing startling about such elementary observations. They are obvious. Each one, however, is true also for young adolescents. What is startling is that we do not arrange institutional settings, especially junior high schools, to these absolutely fundamental growth characteristics.

There is a lot of "static" in the junior high school classroom. Some of it is externally created by the refusal of the school to accommodate the developmental needs of the age group. Thus, if we insist that thirteen-year-olds remain seated upright and still forty-five minutes for five or six time-segments during each day, we are bound to have institutionally created behavior problems. (Such rigidity would be considered child abuse with toddlers; with adolescents, the responsibility is shifted to the teenager who, in effect, is seen as an abusive child.) Likewise, while we nurture developing friendships among pre-schoolers, we separate friends who, upon entering puberty, are fearfully labeled "the peer group."

Teachers and administrators need to examine the institutional causes of disruptive behavior, bearing in mind that silent unhappiness is as disruptive of learning as is vocal or physical acting out. They must also be sensitive to their students' "inner static," the noise from within that is sometimes so distracting that students cannot be receptive to anything that is external to their immediate concerns.

The egocentrism of adolescence places the young teenager in a paradoxical bind. On the one hand, everyone is looking (what

David Elkind calls "the imaginary audience"). On the other hand, one is totally alone, unique in a vast, uncaring, unnoticing universe ("the personal fable"). Alone but always on stage, scrutinized but rarely understood, the young adolescent must test hypotheses more compelling than those of science classes, live through plots more enervating than Aristotelian tragedies, and learn codes more enigmatic than French idioms. There are days, sometimes weeks (and, alas, sometimes more) when no curriculum can compete with the complexities of the drama being played out within the group and within the self.

Inner static can come from the adolescent growth spurt. The onset of menstruation, the failure of an attempted intimacy, the success of an attempted intimacy, the contemplation of an intimacy not attempted, the wrath of a parent, the hurt of a friend, and on and on and on. There is so much change occurring so rapidly that sometimes all circuits must cut off because they are overloaded.

I am not arguing that young adolescents should be schooled in therapeutic clinical institutions. Adolescents are no more and no less likely to suffer from emotional disorders requiring professional intervention than are adults (the figure is about 20%). I am arguing that there are observable normal growth characteristics which we too often consider pathological, or at least deeply irritating and in need of correction. We are not as accepting of so-called teenage behavior as we are of the behavior of other school-age groups. In fact, just to call someone "adolescent" is to be pejorative.

Instead of attempting to reform adolescents, we need to harness their energies in classroom structures and with curricular approaches that mesh with their normal push toward growth and individuation. We need to drop our control mentality so we can see how hungry they are for experiences that call upon their yearnings for socially useful activity, adventure, new relationships, compelling facts and ideas, moral choice, and everything else we imply when we use such terms as "separation," "individuation" and "commitment." In too many junior high schools our children are starving.

Sometimes metaphors can be an insult. To be concerned that people are hungry for meaning and unconcerned that they are literally hungry for food is not only an "artificial expedient," in Artaud's terms; it is immoral. Health deficiencies impair the mental and emotional development of the young. Undernutrition, episodic hunger, prenatal and early childhood malnutrition may impair neuromotor maturity and lead to school performance similar to that of learning disabled youngsters.

Even without physical and neurological deficiencies, hunger hurts. It creates an "inner static" louder than the "compelling force" of any idea. In this context, the ravenous teenager raiding the ice-box is a luxurious middle-class caricature of adolescent hunger. The ice-box, after all, has food in it.

By the junior high years, students are too private to share their problems about hunger with others, especially teachers whom they see for such a short time each day. In some schools, hunger is obvious, in some it is totally absent, and in some it is episodic and almost invisible. Some teachers discover by accident (a box of crackers left on the desk which one or two students always "steal" from) that apparently nourished students are famished until lunch period.

Physical hunger makes curricula irrelevant. We should not tolerate it as educators or as human beings. We certainly should not attempt to force-feed knowledge to a person whose stomach is empty.

But the questing hunger of the healthy, well-fed, developing adolescent should also be recognized. We manage all too often to stamp out this creative hunger, so that children who were once so eager to learn are, at a time of great plasticity and ebullience, no longer seeing the classroom as appropriate to their quests.

Pasternak says that "the whole of life is symbolic because it is meaningful." Sometimes the use of a new symbol or metaphor rearranges our awareness of the meaning of an experience. If we begin to see our students as "hungry," we can change our perception of them from anarchists to questers. By changing our perception of their behavior, we may change its communal meaning, and thereby our responses to the "simple power of being hungry."

GRAVEYARD

There is a bowl of rice
an open tin of rainwater
brittle flowers.
The Buddha is dressed
in red
and in moss.

Drive a stake into the ground
sever the heart
the lungs, the head
from the body.
We are leaving you now
shouting
to frighten your demons.
It is the law:
we must break ties
with the dead.

Three Buddhas
stand in red robes
by the roadside,
in the roots of a great tree.
They hold hands
for the next big rain
will wash them away.

Grace Massey

WINTER IN NEW ENGLAND

Desire pours out the chimney
like smoke
from the lake house in Penacook.

The ice is on the glass,
a Chinese empress —
elegant in her figured robe, & cold.

A little light snow
draws over the town
by the river like a lover . . .
the Charles, sleepwalking in its silver skin.

In modern suburban December
a friend's station wagon dies in a parking lot.
The cables connecting our two cars
are an expression of love & friendship.

This air
came from China, over the poles.

Joyce E. Peseroff

The Pre-professionals

A Self-Portrait by Late Adolescents

ELISE FORBES PACHTER

The class of 1978 is pre-eminently a group of pre-professionals. They are distinguished by their desire to become well-paid, well-regarded and effective members of society. They have directed their energies and moulded their interests around goals four to twelve years away, apprenticing themselves to purposeful, adult life-styles. Until recently, such commitment to the work-a-day world would have been anathema to high school students. Now, with what must be a prescience of future economic constriction coupled with a realistic assessment of the nature of our competitive society, they are dispensing with the years of retreat and rebellion. We may see evaporate before our eyes that peculiarly American phenomenon (and indulgence) – the adolescent years – and be reintroduced to the original meaning of the word adolescent: becoming adult.

Last year I manned a Harvard/Radcliffe booth at the District of Columbia College Day and was inundated with questions about medicine and law. Students thought the law school was not only distinct from but also alternative to the liberal arts program. No one asked about academic requirements and course distribution; they wanted to know how one applied to the law school. In England or France, this would be a perfectly reasonable question. Our system of collectively holding our pre-professionals together for an undergraduate experience has made them impatient. Energies ready to be loosed on graduate schools are held in bound for four long years. If the tide is strong enough, the channel may break, and we'll find the liberal arts B.A stranded.

This article is based on interviews with 384 students from the greater Washington area who applied for admission to the class of 1982 at Harvard/Radcliffe. The portrait is drawn from what the applicants told their alumni/ae interviewers about their school activities and offices, community work, term-time and summer employment, career plans, grants and awards, and college-level courses and seminars. If the resulting image seems precociously polished, so much the better, for it will accurately reflect the effort this generation is putting into image-building. As co-chairman of the committee that oversees the work of the interviewers, I have heard the students in this study described and have seen both the factual worksheet and final report that resulted from their interviews. The sample of students broke down as follows: 223 men and 163 women, 42% attending school in suburban Maryland, 35% in suburban Virginia, and 26% in the District of Columbia. 68% go to public, 25% to private, and 7% to parochial schools.

One of the most serious tasks students now face is choosing a career. Planning to make college education a vocational experience, they feel that they can't get to college without having already espoused a career. The complexities of a liberal education, an education for 'life' not 'livelihood,' takes a disregard for the practical that this generation doesn't have. They are pragmatists, and pragmatists want goals. The nature of their career choices is governed by their realism: on the one hand they lean toward remunerative and established careers, and on the other hand, they try to hedge their bets. Thus, students have back-up career choices in much the same way they apply to fall-back colleges. Being aimless worries them: a number of students apologized to their interviewers for not yet knowing what they were going to do. Others, who were also undecided, spoke about keeping their options open, as if those options would shut if left unattended.

Students avoid what they see as unrealistic career choices. Of the 384 seniors, only 43 mentioned the arts as a possibility, only ten as their sole choice. Five of these were men (an artist, an actor, a musician, a film director and a writer) and five were women (four writers and an opera singer). Theatre, dance, fine arts and museum work were all mentioned, but few students are sure that they can turn their artistic talent into a self-supporting career. The would-be dancer said that medicine and law were her safety choices. A young man who had won important art awards and who brought a stunning portfolio to his interview said that he was going to go into city planning, political science or the State Department, but, emphatically, not art. Even the practical or applied arts, such as architecture, had few takers.

Seniors were almost as cautious about careers in the social sciences and languages. There were six linguists (five with back-up choices) and five city planners. Five thought they might teach. Area studies was indicated twice by Asian-American women (Far Eastern studies), once by a future businessman/banker (Near Eastern studies) and twice by students interested in the USSR. Only the first two failed to say how their expertise would be applied. Six students marked history as their only career choice and another seven as a possibility. One pre-lawyer shared this orientation but put his finger on the problem: "history is interesting, but not very lucrative." In addition there were six political scientists, one of whom plans to work at Rand or Brookings. This is not a speculative age. I unearthed only five (four women) interested in archeology and anthropology; a single sociologist surfaced.

Two jobs that I expected to be popular, even glamorous, choices, weren't. Fourteen students are considering becoming psychologists, and six of them have other possibilities as well. This area lent itself to titles, as if to give credence to the choice: there was a "forensic psychologist," a "child psychologist," and "clinical," "research" and "teaching" psychologists. Only one student considering medicine mentioned psychiatry, and then only if he couldn't make it as a surgeon. Journalism was the second surprise: in the era (and area) of Woodward and Bernstein, sixteen considered it, but only four as their single choice.

Business is a better bet: it's considered vital, challenging and lucrative. If we include marketing, industry, economics, finance, business administration and accounting (the categories are, of course, supplied by the students), we find seventeen women and twenty-six men, twelve of whom have it as their exclusive choice. One woman says she's attracted to business because it is "active, varied, practical"; another calls it "something dynamic." One man envisions it as part of a career that includes business, economics, law, journalism and math; a pragmatically-minded entrepreneur will combine "business, banking, the stock market and Near-Eastern studies."

A larger group of students among the 384 is interested in government; of these fifty-four, twenty-two have it as their only plan. Because these are Washington students, quite a few appreciate the fact that the federal government is a good employer. The highest office aspired to was congressman. "Politician" is an acceptable title (again, we are in Washington). One realist listed his choices in ascending order: "civil servant, political aide, politician." Almost as many women as men are interested in the political arena, and more women than men plan to enter the foreign service.

We come now to the second largest body of students: the pre-lawyers, twenty-six women and thirty-six men. Of the women choosing law, a number had very specific ambitions: practicing "tax law," or "criminal law," being a Supreme Court Justice, or "upholding human rights in a centralized political environment." The striking thing about this career choice is that, like that of government, it attracts almost equal numbers of women and men. Correcting for the percentage of women in the over-all sample, law trails government but leads business as a choice for women.

By far the most attractive careers today are in medicine and science: here there are 61 women and 147 men. The categories used are "pre-med" (favored by women), "doctor" (favored by men), veterinarian, dentist, medical research, engineering, science, computer work, electronics, aero-space. Nowhere else do we see such precision of choice nor such precocity of specialization. The largest group prefers medicine: twenty-two women and forty-six men. Unlike all the career choices we have discussed above, the

DALE HORNE

majority of these students have no fall-back careers. Another symptom of their decisiveness is the thought that has gone into postgraduate specialties: "pediatrics, ophthalmology, or ob/gyn," "brain surgeon," "diagnostician," "family practice" and "internal medicine."

A number of science pre-professionals have already served in the field: at least twenty-six have had fellowships from the National Science Foundation, American Heart Association or American Cancer Society. These grants put students in professional settings. Thirteen have worked at the National Institutes of Health (NIH). Thus, for students who compete for grants as early as the summer after 10th grade, it is possible to have been a "pre-med" student for six years before applying to medical school. This comes as close to an apprenticeship system as the profession allows. One woman was listed as sole author of a paper which came out of an NIH lab: her mentor felt that she deserved the credit for the work. Other students are co-authors with full-fledged members of the scientific community, an impressive credential at sixteen or seventeen.

Pure scientists are also numerous. Here again there are grants (Telluride, Bausch and Lomb, Westinghouse and university programs for the gifted) to be won. Traditionally at this age one applied oneself to winning prizes at science fairs; for the talented student today, this is a way-station long since passed. Only six mentioned it. More than in any other field, a young science student can get a glimpse of what actually lies ahead and make educated choices: "synthetic chemistry," "physical chemical research," "toxicology," "energy research, optics or subatomic particle research." Such refinements of career choices are admittedly ambitious, but they reassure the student of his own seriousness of purpose.

Aside from those who plan to do medical research (12) there are nineteen who mention science generally, and another sixty who have chosen specialties. The largest single group among the specialists is the mathematicians, followed by biologists (the only group with a significant number of women), physicists and chemists.

Applied scientists are less common: twenty-two engineers and six computer experts. In aeronautics there are also six, including a woman who plans to work on the space shuttle.

Students are taking college courses in record numbers while in high school. Twenty-five mentioned that they were taking at least one course in a local college; two were full-time enrollees who were still going to graduate with their high school classes. Even knowing that the advanced courses will have no effect on their standing in the Ivy League colleges, students are eager to add to their academic loads. They would prefer not to sample noncompetitive courses at their high schools or have an easy senior year; they are anxious to get on with "it." Eighteen students said they had been to college summer courses and university-sponsored seminars; nearly as many had been to the Governor's School for the Gifted in Virginia.

Since future employment is an important goal, it follows that students are exercising their work ethic while in high school. 70% of my sample had been employed; of the jobs held (I counted jobs, not students, so some students contributed more than one job description) one quarter were career-related. The vast majority of these vocational jobs were in the sciences – working in labs. A surprising number of students combine work and study. One boy works at the A&P 30-35 hours a week; 20-30 hours at a local shop is not infrequent. Students surround their school commitments with work, be it for spending money or professional advancement. Necessity is not the dominant note. Working appeals. Of the 339 jobs described, only a handful – six and fourteen respectively – were in areas I associate with my high school years, social service jobs and camp counseling.

As I looked at the descriptions students gave of the involvement in community affairs, my findings confirmed the serious and career-minded profile we have seen above. Forty students were active in church groups, an additional two as church elders, and twenty in the Boy and Girl Scouts. The next-largest group had worked in political campaigns and offices. Then came those helping the young or elderly, followed by a small group volunteering in hospitals.

There were seven student advisors to adult committees, two more had responsible neighborhood planning jobs, and one was on the board of an alternative house. What is striking about the picture that emerges of student community activity is that it emphasizes responsibility rather than social action. Students are associated with organizations, not crusades.

Among school activities, the ones with influence and high visibility and the ones for which one has to compete are the most popular. First comes sports, then publications (in descending order – newspaper, literary magazine, yearbook), student government, music and drama. Of middling attractiveness were the activities that help hone academic skills: languages, "It's Academic" (a T.V. quiz show), debate and forensics and, last in this category, the model U.N.

The group of activities in which there was least interest tells us the most about this generation. Those clubs that do not train for competition, but stress personal fulfillment, were only infrequently mentioned. Social service and tutoring had twelve members, chess eleven, strategic games seven, art six and dance five. Student relations committees (black/white relations) also had five members, conservation and ecology three, and women's groups two. (The women's movement, while it no longer spawns new discussion groups, has had its effect: this generation of young women is profession-bound from the beginning. Only one woman mentioned marriage – as did one man.) Issues clubs are almost defunct. It's back-to-basics, back to the competitive, organized leadership-proving activities. Judging from my sample, no single goal aside from the desire to have a career moves this generation.

While high school students may at times feel the need to join forces for a cause they believe in, they are unimpressed with the attendant idealism. They lack the experience necessary to be cynics, but their caution and objectivity have similar results. A local student wrote to the *Washington Post* on May 8 about his reactions to Sun Day observances:

> Sun Day was very special to me because I learned an important

> lesson. Along about the second or third "do," it suddenly dawned on me that I had always envied the older kids in high school and college who were deeply involved in the anti-war movement. But I was too young. I was making myself believe that this was my chance to be involved in a great cause.
>
> Here I was running around Washington, finally able to do what those kids had done. But solar energy isn't peace, it's a bunch of Boy Scout projects. And nuclear energy isn't a corrupt war in Vietnam, it's a very complicated necessity that some people hate simply because it's very big and messy. And this wasn't a movement, it was a bunch of kids and adults, who should have known better, acting silly.
>
> For a while I was right in there with them, creating a phantom enemy and chanting about a phony panacea just so we could satisfy our fantasies about living in the past. But after a while, I got embarrassed and made it back in time for my accounting class.
>
> Dennis L. Loomis, Silver Spring (Md.)

It takes more than a simple statement of purpose to become a pre-professional. It takes a distinct attitude. It also requires self-discipline to make decisions and to stick by them. To have that discipline one must have a strong motivator. The main sources of motivation are, not surprisingly, money and status. As one student put it, being a doctor gives one a high level of self-esteem. When people wonder why this generation should be particularly concerned about these basic needs, they are implicitly comparing them to the last generation of students. Yet students are not traditionally a class apart in America – as they are in Europe – and don't derive their attitudes from earlier students. They derive them from their families and society at large. The activists of the 60s were atypical. Today's generation is in harmony with the security-minded and materialistic generation of their parents. The current concern about the erosion of the economic security of the middle class is shared by parents and children alike.

The pre-professional is busy preparing to be an adult. Many students bring C.V.s to their interviews, often with supporting materials. The professionalism and attention to detail is astonishing. One applicant listed, *inter alia*, her membership subscriptions, illustrating graphically her interest in nature. The C.V. covered four single-spaced typed pages. Visions of the future self dominate. 'Who will I be?' is not a philosophical question and can be answered by professional initials, as for the candidate who wants to be "a J.D. and an M.B.A." Students are planning to take concurrent degrees and pursue composite careers (I can't figure out whether a law-business-international affairs combination makes a generalist or a micro-specialist), prepared for any and everything.

Many applicants believe that going to the 'right' college will open the 'right' doors. One student said that he was applying to Harvard because of the reputation of its medical school. Applicants choose Harvard in order to be Harvard seniors choosing law schools. "It's the best," "You can't beat Harvard" are their expressions of faith in the system. Two types of students rely most heavily on the reputation of Harvard: those who are unlikely to get in but who believe that just as the name is magic, perhaps something in their record will have the magic to trigger that door. "Harvard doesn't always take the obvious candidate," said one woman to me two years ago, after a dispirited discussion of her qualifications. The other kind of student has mastered the workings of his high school and believes in the power of perfection. 4.0 averages exist in almost all the public high schools, although at the most competitive, they are hard to attain. Most of the high-powered students are in the 3.8-3.9 range (if one can call it a range). Their averages usually slipped over 9th grade gym, or the bright student's nemesis — driver's ed. The discrepancy between excellence and perfection is a source of embarrassment to the student, who almost invariably volunteers an explanation.

Bent on distinction, students are also able to see that there are other ways to influence their admission. Ethnic and racial background is known to be a factor. Two candidates had a great deal to say about the one-quarter of themselves that was American Indian, and in one case, an advisor had steered the candidate toward further involvement with the American Indian heritage so that it would be unmistakable among other community activities. Another enterprising but less sophisticated senior took pains to point out that in her *particular* Montgomery County high school, being Jewish put her distinctly in the minority!

The effect of preparing oneself for a certain end is far-reaching. This generation of high school students is precociously interested in adult life-styles, not for their freedom, but for their responsibility and productivity. Students are eager to take on the demands of the age group above them. One student traced her community activities back to the time she was 13 and "stagnating." The precocity is unleavened by experience. Just because the measure of oneself has become academic perfection, responsible commitment to activities and careful preparation for professionalism, there has been a serious disregard for the uncontrollable realities of the world at large. In fact, students are subject to forces they can't influence: the opportunities are non-negotiable. And no one mentions luck.

If self-esteem, sense of purpose and pride is to a great extent bound up in one's work (and if this process begins at age 14 as a voluntary act rather than at 22 as an unpleasant task), then the apprenticeship system that has informally been created had better have built-in guarantees. The professional schools will have to turn back the percentage of students that they feel cannot reasonably expect employment in that field, or they will produce a large class of skilled unemployed whose debts are enormous and whose earning power is inadequate. It worries me that self-esteem so neatly coincides with social status, for some of the students will have to seriously reconsider their self-image during their college years or after graduate school. It could be disastrouslydisillusioning to have as a goal the unattainable. It is probably easier to satisfy or retain the generalist who "wants to help people" or "do something relevant" than the specialist who knows exactly what he wants to do. At the least, serious job counseling and cautioning should begin when the student is still deciding about his major. And one should take advantage of the vocational mood to let students know where the jobs are.

While it is important that students learn how to work effectively with groups and develop their leadership capabilities, the simply pleasant pursuits should not be lobbed off at age 17. What satisfies the self may or may not be the basis for a paying job, but time is not so precious that one can't cultivate it. When I applied to college, one of the most important qualities one could present was the cultural exposure represented by foreign travel. Today, we have applicants who have spent years abroad worrying about what they have missed by not attending American high schools and feeling somehow disabled by their overseas experience. Yet travel is not mere exoticism, and to abandon it as part of an education is parochialism.

There is another potential hazard of early specialization: unless retraining and second careers become part of the process, some students will have been routed so long in one direction that other important interests will have atrophied or never have a chance to develop. It will be hard to be flexible about where to go when one has already spent so much time and energy trying to get there. A friend who recently served on a medical admissions committee told me that students at their interview asked her what they should be like to get in: "I'll do anything you say." What is initially powered by enthusiasm and interest will more likely come to rely on the sting of competition and the need to have one's plans survive. Too many students worry about having activities and employment that all point convincingly in one direction, as though they can more easily get where they want to go by seeming as though they have already gotten there.

Above all, our society may not be able to support a huge professional class at the pay now expected. The generation of the mid-to-late 50s and their children of the late 70s and early 80s have put a lot of faith in the maxim that where there's a will, there's a way. For the sake of the pre-professionals, the system had better bear this out.

LIVING WITH CATS

One of them walks down the stairs,
Pauses to sniff my shoes.
Flattered, I watch her linger,
Exploring the smell
Left by the press of my foot.

Later I open the back door.
Scattered feathers, a curled entrail, still soft,
Fragments of bone,
Lie randomly on the porch.

These finely furred cats, greedy for sunlight,
Push their faces, slit-eyed, into my lap,
Spilling my projects
To the ground.

What are these projects?
I want to know
How am I to live in this body
Sniffing our pleasures
Slashing at things that fly,
Rubbing myself against aliens?
What is to be done about love?

Suzanne Gallant

GREGORY MOTEN

An Anatomy of Learning[*]

Twenty-seven Fractions in Search of a Common Denominator

PETER FARROW

> "Oh, that's easy! A *good*
> teacher cares more about
> learning than teaching. . . ."
> Lisa, aged 9

One of the graver hazards of teaching is students. Challenged by other adults or by inner doubtings, the teacher can usually muddle through. One may even muddle through an entire symposium. But no one muddles long or safely with students. Their challenges often batter the walls of our presumptions – and our ignorance.

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[*] This work is drawn, in part, from ongoing lectures and dialogues here at Country Mile, some of which were concurrent with the Andover Symposium. Organic concepts of learning derive, obviously and as noted, from Pierce, James, Dewey and others, less obviously though more vitally from the long-standing work of Dr. Albert Barnes, Violette de Mazia and the Barnes Foundation as a whole. I am indebted to Brian Drayton of Harvard for the dozen years of happy hassle over some of these concepts; to Stefani Burk of the Center for New Learning & Research for much critical discussion and suggestion; and to William Brown of *The Andover Review* for his long encouragement – and patience about deadlines.

For more years than I'll confess to, I've been nagged by the comment quoted above. I can't blame Lisa. It was in answer to my own question: *What makes a teacher 'good'?* Neither can I disagree with her, except on one point: it is not at all easy. I know a little about teaching, and I certainly care a great deal about students' learning. But I don't *know* about learning.

I suspect I am not alone. Learning has accumulated a host of concepts, theories and methods beyond hope of consensus. But on analysis, most deal not with learning *per se* but with the external production of it; the thing itself remains largely undefined. The result is an abiding ambiguity overshadowing our efforts, including those of the Symposium. While we spoke well and listened bravely, as for *learning itself* we were twenty-seven fractions in search of a common denominator.

Can, then, an objectively valid definition be discovered?

The problem of criteria

Such a definition must stand as a very common denominator indeed, meeting the sturdiest of criteria. It must function in and be demonstrable by scientific inquiry, presenting not only general constancy and principle but some immunity to the nibblings of minutiae and specificity. It must provide full play to the scholarly, the philosophic and the spiritual while fortifying no exclusive cult. It must translate clearly to the empirics of teaching and should be simple enough to be grasped and used by the child.

But these deal only with the human sphere. To be objectively valid, the definition must encompass an infinite diversity of phenomena outside that sphere. We must be able to discern its principles wherever learning is found, from *Homo symposiensis* to *Amoeba proteus.*

It is at this point that either hackles or indulgent smirks begin to rise. To accord such attributes as consciousness, abstraction, volition, cognition to protozoa, when we are barely willing to accord them to Yale or Stanford, is to invite being charged with the most heinous of scholarly crimes, Anthropomorphism. Still, it may prove to be worth the risk, for fear of that grisly charge may be the chief impediment to our understanding. Let us then preempt it with the countercharge of Apotheosis and give that Olympus of singularity, from which Man views all things non-Man, a long-overdue shaking. This goddish view is uncopernican, unscientific and downright silly. From mouth to anus we confess our alimentary debt to the worm; we concede our bones' chemical kinship to the oyster; we cheerfully compare our anatomical scheme with the frog, while sharing lactation with shrew, sloth and whale. Might we not, then, share a cognitive principle or two as well?

Polemics aside, we have more to fortify that contention than to refute it, when learning is given objective scrutiny and considered as a function essential to, and inseparable from, the interaction of organism with environment – whether that organism be processionary caterpillar or Ph.D.

Such a view is hardly new. This organic, experiential concept is the basis of much of the theory advanced by Pierce, James, Dewey, Barnes and others in the first half of this century. But their views can be (and are) dismissed as being more philosophic than scientific. Do they coalesce with the "hard" sciences as developing in this century's second half? I believe they do, and that a marriage of ideas can give us some insights into learning and, by them, provide at least a rough definition.

"Learning" and "government"

One of the hardest of those "hard" sciences is cybernetics, which possibly can provide a model for the discovery of our definition.

As in education the root idea is *learning*, cybernetics' root is *government*. Objectively seen, *government* is found to possess meaning far beyond its conventional political contexts. That meaning, reduced to principle, is as validly applicable to machine and amoeba as to man. By its principles we may analyze the control of a missile, the workings of a political system or the ethological squirmings of protozoa, since all involve some form of government.

Cybernetics has arrived at its principles not, as popularly supposed, by some abracadabrous technology but by consistently considering the phenomena of government where they may occur, without *a priori* exclusion.

Such a notion is hardly unique to cybernetics. It is the notion of all sciences and the premise of each. To the chemist (as Rumer Godden delightfully noted) "all things are pure — even horse-droppings. . . ." The elements of chemistry, their individual natures and their combinant principles reside in biscuits, monkeys, frisbees and the chemist himself. There are no special tables of elements for Man, nor special laws of gravity for his descent.

Nor, perhaps, special principles for his learning.

An anatomy of learning

Like any good science, let it begin with hypothesis — in our matter, a hypothetical definition. Let us say that learning, simply enough, is that process by which the known is applied to the unknown.

In rough, this meets most of the criteria cited. Indeed, it enhances them. For the scientist, it describes both process and purpose of science; for the scholar, it implies the highest laurels of scholarship, while providing philosopher and theologian with a sound *raison d'etre* (long needed). For the teacher, it works best of all: it summarizes and justifies vocation, hints at both method and curricula and, while retaining the critical fuzziness, might lend a certain euphony to grant proposals.

For the child, of course, it is just a stuffy way for grownups to describe what he has been doing all along.

We might hope for consensus, even unanimity, were we to restrict this definition to human learning. But we must look at learning wherever it occurs, if we are to discover its objective principles: "Applying the known to the unknown" is an exceedingly pervasive process.

In an objective context, it is possible to construct, in very general cybernetic terms, a sequence of functions utilizing past learning and culminating in new learning, by application of known to unknown. These functions may be listed as

Sensing – the receipt of stimuli by the organism;

Referral – the interpretation of stimuli into meaning, by reference to a memory system;

Selection – establishing priority of stimuli;

Formulation – the planning of response, in terms of the interpretation given the stimuli and in terms of

Preparation – the "mustering" of resources necessary and available for executing response; thence

Efferent Order – to the effector parts to perform the response; and

Afferent Order – the feedback from effector parts and supplemental sensings regarding the status of the order and the result of its execution, which may or may not require

Correction – of at least the initial efferent order and, potentially, of the whole sequence back to the point of selection.

Finally, as the product of these, there occurs

Storage of information derived from the success or failure of the response, and made retainable for future reference. It is this last which we call *learning.*

We might take, as example, a very young child who, in the process of learning to walk, trips over a rug, picks himself up and goes on. The sequence of functions described above can easily be identified, but to restrict it to the event alone would be missing the idea of learning.

Let us say that, at some future time, the same child, toddling across a lawn never before known to him, comes across a watering hose, never before seen by him, but – in spite of these being unknown – he steps over the hose and so does not trip. The child has, in effect, abstracted the idea of tripping, transferring the experience of one event known to another unknown. He is dealing, if you will, in metaphor: in the trippingness or trippability of rug and hose. He is, in a word, learning. The functions involved, of course, apply to positive example as well, without end, and not only to child but to all life, as we shall see.

Presumptions and inferences

Such a "cybernized" view as I have given, in listing the functions associated with learning, may seem mechanistic, if not rubegoldbergian. It is intended only to serve as a sort of mapping or checklist. Broadly, these functions are the governing constituents of biostasis. In operation, of course, the functions are not linear, on a one-then-two-then-three basis. Each reciprocates and modifies the others.

It is important now to define these functions more closely, for two reasons: first, to take into consideration inference as well as specific operation; second, to shed some long-standing presumptions.

One of the commoner presumptions is conceiving sensing as relating only to extrasomatic stimuli — those arising outside the organism's biological entity. In reality, by far the greater number and frequency of stimuli arise within the body. Through proprioceptive and kinesthetic sensings, for instance, we know the location, state-of-readiness and motion of our bodily parts. But we fall into another presumption by the use of that word *we*, which presumes duality between mind and body. Stimuli are generated by and within the mind alone; we have the sensations of thinking — cognition, ideation, intuition, just plain old hunch — plus the whole grab-bag of emotions. There is no end of sense.*

Referral and *selection* are so closely reciprocal as to be parts of the same function, neither having completion without the other. Two aspects of selection are worth noting carefully: the selection of one stimulus over another is not random; and it is not necessarily relatable to the amplitude of the stimulus. Thus the whole raw

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* And thus a tidy possibility, not for the scientist, but the philosopher and theologian: since all sensation is referred to some process of judgment; since we sense within our minds and that, too, is judged; and since we sense that judgment, too, thus making it subject to referral, *ad infinitum*, where does judgment stop? At *ubergeist?* Ultimate Particle? Soul? Or Judgment?

DANIEL WHEELER

data of sensation must be submitted to some sort of critical reference for interpretation, the specific selection being governed in terms of criteria so provided. What this infers, in all life, in at least a prototypical way, is judgment.

Selection, referral and judgment do not just imply but absolutely require some sort of memory system. In its objective sense, memory is "stored experience" – the cumulative learning derived from individual and species, inherited as well as acquired. What we call "instinct," then, lies in continuity with, rather than opposed to, what we call "intelligence." Though this means shedding our favorite of all possible presumptions, that instinct and intelligence are somehow mutually exclusive, no objective evidence for that presumption exists, from the standpoint of function. Each requires, and complements, the other – a point we shall return to in a moment.

The formulation of response requires some form of selective judgment on at least a binaretic, or yes/no, do/don't basis. It may be seen, in essence, as being akin to the forming of hypothesis in formal scientific method. Here again we run afoul of a presumption: that scientific method is an invention of mankind, reserved to the higher flights of human inquiry. Objectively, it is the essential method of all life, and all life is functionally equipped to perform it. Formulation stands, then, as the rudiment of imagination, the fundamental what if? – a critical run-through of possible responses and possible results by which is chosen that response deemed most likely to succeed. (Though an organism chooses to make no response, it is still responding.)

The choice of response is determined by the preparatory factors – what we have called here a "mustering of resources." It is important that these not be limited to proprioceptive and kinesthetic sensings, to the motor potentiation of tool, fist, fang, claw or pseudopod. Resources include memory, experience, judgment as well – the basic ingredients of ideas.

In the efferent/afferent functions, the critical factor is correction, not merely of the specific motor order* given, but potentially of the whole hypothetical plan. (Here again we bump into a presumption, this time just a colloquial one: properly, hypothesis is not proven by trial and error, but by trial, error and correction.) Any form of correction infers judgment's again coming into play. weighing the empirical against the theoretical, the actual against the imagined – expectation fulfilled, modified or nullified by experience.

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* By uncertainty, any efferent order must be presumed to require correction at some point, since it is subject to entropy, and since it is predictive, not empiric. It aims only as closely as it can; it cannot guarantee absolute bullseyes.

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All of these functions imply *learning* – the application of the known to the unknown. The particular learning may indeed be slow to the point of despair, but it not only will, it must, take place.

It is here that we must return to that great dichotomous wrangle, Instinct *versus* Intelligence. All learning involves some measure of abstraction. Abstraction is the very stuff of intelligence – and man is extraordinarily stuffy about it. Let us marshal our *hubris* and trudge on.

Abstraction, instinct and evolution

Once shorn of our presumptions, instinct appears not as some immutable code programmed into an organism from Day One onwards, but as both a form and a product of abstraction – the same "metaphoric" function that saved our exemplary child from tripping on the hose.

Our customary view of instinct is, technically, assbackwardoidal. We think of the organism as acting out his allotted role for his allotted time in a strictly allotted way: instinct rules supreme, triggering every nibble and kneejerk of his existence. Historically, the exact reverse is true: Instinct's rules arose from the individual, and however slowly, still arise. Through the learning functions we have set down here, the organism's responses to its environment were either successful or not successful. If not, it went back to square one, or died. If successful, it reproduced and passed its learning on – as instinct.

Each living organism is a monument to past success, its instinct a digest of previously-successful behavior — a sort of spiral-bound Handy Pocket Guide to Biostasis. But it is a digest, not an encyclopedia, an abstraction of experience into learning, of learning into meaning.

Instinct is abstracted not out of quantitative considerations, not because it is more economical to abstract than to pass empirical experience along wholesale. While not infinite, the capacity for genetic transfer of information is massive and, current knowledge indicates, would tend to increase to accommodate more information rather than to reduce the informational load — although fraught with trivia and vestigia. Empirical information could be passed along wholesale. It is abstracted simply because it must be, regardless of how vital or successful the empirics of the past.

The operant word there is past. Were instinct to imprint absolutely exact responses on the organism, the organism would still have to respond in and to an environment which, neither subject to instinct nor predictable by it, can be not only subtle but often downright mean. All instinct can do, then, is hope for the best in terms of the past. Life, being variable, demands variability of response; otherwise adaptation would be impossible.

Each generation and each individual in each generation are not the slaves but the crucibles of instinct, testing, confirming, modifying and, in varying degree, erasing and rewriting the lessons of the past learning — a process otherwise known as evolution.

Consciousness and volition

We have been seeking some sort of common denominator for learning, considering it as a process inherent and necessary to all life. *All,* like *never,* is a very dangerous word, and has kindled more than one *auto-da-fe.* Are there exceptions?

The principles themselves can be evidenced by rather basic behavioral experiment and demonstrated in analogue by cybernetic model. But what of consciousness, volition and the dozen other attributes which traditionally separate Man from lesser beasties?

Such questions may be begged: they are not strictly scientific and arise from theological and philosophic considerations, at least historically. But what seems of importance here is that the principles hold true even in the context of the special phenomena of human affairs.

In an objective sense, physiological consciousness is observable. all the way down the ladder, as is the will to live. Awareness, at least as we know it, can only be speculated on, as can conscience – both of them fairly recent developments in man himself, and still not suffering from overabundance. Concern for, and ability to project, the future – much touted as exclusively human characteristics – have their functional prototypes at the lowest levels. "Formulation of response" projects the future, albeit a very short-term future; provision for the future is evidenced not only in reproduction and genetic variation, but in the individual organism's latitude of response – in the way in which each applies the known to the unknown, the individual accumulation of learning.

Argument for the human exception is, objectively, moot: we are seeking principle, of which will, consciousness, morality, conscience are not qualifying factors *per se*. A man wilfully stepping out of an airplane does not fall at some special rate of acceleration because he chose to fall, is aware of falling, and can project the consequences of his descent. Though he recite a Te Deum and the whole of Heyl's equation, he must stick it through with the same principles of gravity affecting an apple's fall from its tree. Man's responses to falling will indeed be different: very few apples invent parachutes – a point on which we might credit man were it not that even fewer apples* need them.

Man's uniqueness is for the most part quantitative, residing in the number and variety of his responses and resources (including his extragenetic and extrasomatic storehouses). But the scheme by which he responds, by which he applies known to unknown, remains in principle the same though, for himself, he may insist that it be called not scheme but *schema*.

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* Regarding apples: I have otherwise restricted this polemic to the animal kingdom, protozoa alone being a large enough mouthful for human presumption to swallow. But the principles of learning can be applied to all life – animal, plant or academic.

Proofs

There comes now what we might punnably dub the Moment of Proof. Much of the foregoing is, of course, speculative and inferential — speculation and inference being two of the commoner ways of applying the known to the unknown. The evidence is circumstantial, deductive and thereby vulnerable. I have stated principle not so much in terms of what is, as what must be: there must be, say, some sort of memory system, some means of judgment, some form and degree of abstraction.

Function and evidence of function exist even though we cannot precisely trace that function to a specific anatomical seat or system. Obviously, a Proteus exhibits no homologue of the human brain, but it does, by some analogous method, functionally apply known to unknown. If we fail to see just how it turns the trick, the fault lies in the present state of our knowledge and not in Old Phoneyfoot.

Personally, I do not feel any present lack of "hard" evidence will be of long duration. We will inevitably continue to apply the known to the unknown, even in the rubble of Olympus. It may even come as a relief to discover, after these long, lonely, Ptolemaic years, that all life is intelligent, all life learns.

WHEN SHE THINKS OF IT

she thinks perhaps of light
in a corner room. There are no curtains.
Only the clean windows, blue
with sky, the hanging plants that pattern
the bare wood floor with shadows.

Sometimes she thinks of someone else,
you perhaps, with flowers
from the shop where she used to walk
before the pain.
Sometimes she thinks of pain.

And if she thinks of floating
it's not on air or clouds, the river risen
to the windows but the light.
She thinks of floating
on the light.

MARTHA COLLINS

Contributors

ARTICLES

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POEMS

Martha Collins lives in Cambridge and teaches creative writing at U. Mass.-Boston. She has published in numerous periodicals and a few anthologies, among them *Images of Women in Literature*. She has been at the MacDowell Colony, and she spent last summer at the Virginia Center for the Creative Arts.

Suzanne Gallant lives in Somerville with her two children. She scribbles and scribbles and enjoys it.

Richard Hawley's poems have appeared recently in *bits*, *New York Times*, *America*, *Commonweal*, *Berkshire Review* and *Hiram Poetry Review*. A chapbook, *Aspects of Vision*, was published in 1976. He is Dean of Students and Chairman of Social Studies at University School outside of Cleveland.

Phyllis Janowitz's book *Rites of Strangers* was published this fall by the University of Virginia Press. Her work has appeared recently in *Atlantic Monthly*, *Harvard Magazine* and *Paris Review*.

Grace Massey is working on a Ph.D. in English at BU. Her poem comes out of a trip to Japan last spring.

Marilyn R. Mumford is Associate Professor of English at Bucknell University. Her poetry has appeared in several little magazines and journals.

Randall Peffer's poems have appeared recently in *Bitterroot*, *Mavin* and the *DeKalb Literary Arts Journal*. His non-fiction has appeared in *Sail*, *Yankee*, *Finance*, *Trains* and *Woodenboat;* more is forthcoming in *National Geographic* and *Reader's Digest*. He teaches English at Phillips Academy, Andover.

Joyce Peseroff's first book of poetry, *The Hardness Scale*, was published by Alice James Books last fall. She is co-editor of *Green House* magazine.